N-TRON
THE INDUSTRIAL NETWORK COMPANY

708M12
Managed Industrial Ethernet Switch

User Manual & Installation Guide

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708M12 Industrial Ethernet Switch Installation Guide

The N-TRON 708M12 Industrial Ethernet Switch offers outstanding performance and ease of use. It is ideally suited for connecting Ethernet enabled industrial and or security equipment and is a fully managed switch.

PRODUCT FEATURES

- Full IEEE 802.3 Compliance
- Eight 10/100 BaseTX D Coded M12 Copper Ports
- Extended Environmental Specifications
- IP65 Rated for protection against low pressure jets of water from any direction
- IP66 Rated for protection against high pressure jets of water from any direction
- IP67 Rated for protection against temporary immersion in water
- Autosensing 10/100BaseTX, Duplex, and MDIX
- Offers Rapid Spanning Tree Protocol
- Trunk with other N-Tron trunking capable switches over two ports
- Store & Forward Technology
- Plug and Play IGMP Support
- Rugged Din-Rail Enclosure
- Redundant Power Inputs (10-49 VDC)
- Full SNMP
- Web Browsing and N-View Switch Monitoring

MANAGEMENT FEATURES

- IGMP Snooping
- VLAN
- QoS
- Trunking
- Mirroring
- 802.1D-2004 Rapid Spanning Tree
- N-RING™ (N-Tron proprietary Ring Management)

 700-NTCD-M12	Dongle Ideal for saving, or restoring switch configuration parameters quickly without the need for a computer or software. Straight M12 A-Coded 4-pin male connector. Includes connection status LED. One configuration device per switch is recommended.
 SERIAL-DB9-M12	Serial Interface Cable See section “Serial Interface” for additional details.

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Warning

Do not perform any services on the unit unless qualified to do so. Do not substitute unauthorized parts or make unauthorized modifications to the unit.

Do not operate the unit with the top cover removed, as this could create a shock or fire hazard.

Do not operate the equipment in the presence of flammable gasses or fumes. Operating electrical equipment in such an environment constitutes a definite safety hazard.

Do not operate the equipment in a manner not specified by this manual.

Safety Warnings

GENERAL SAFETY WARNINGS

WARNING: If the equipment is used in the manner not specified by N-Tron Corp., the protection provided by the equipment may be impaired.

Contact Information

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Suite 4E
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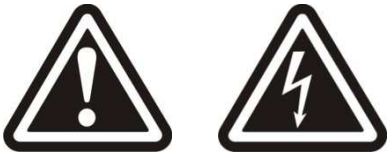
WEBSITE: www.n-tron.com
E-MAIL: N-TRON_Support@n-tron.com

ENVIRONMENTAL SAFETY

WARNING: Disconnect the power and allow to cool 5 minutes before touching.

ELECTRICAL SAFETY



WARNING: Disconnect the power cable before removing the top cover.

WARNING: Do not operate the unit with the any cover removed.

WARNING: Do not work on equipment or cables during periods of lightning activity.

WARNING: Do not perform any services on the unit unless qualified to do so.

WARNING: Observe proper DC Voltage polarity when installing power input cables. Reversing voltage polarity can cause permanent damage to the unit and void the warranty.

Ingress Protection IP67

The classification of degrees of protection provided by the enclosures is defined by IEC 60529. Each rating is defined by specific tests.

The IP number is comprised of two numbers, the first referring to the protection against solid objects and the second against fluids. The higher the number, the better the device is protected against contact with moving parts and the harmful entry of various forms of moisture.

1st IP	Protection against ingress of solids	2nd IP	Protection against ingress of liquids
0	No protection	**0**	No protection
1	Protected against solid objects over 50mm e.g. hands, large tools.	**1**	Protected against vertically falling drops of water.
2	Protected against solid objects over 12mm e.g. hands, large tools.	**2**	Protected against direct sprays of water up to 15° from vertical.
3	Protected against solid objects over 2.5mm e.g. wire, small tools.	**3**	Protected against direct sprays of water up to 60° from vertical.
4	Protected against solid objects over 1.0mm e.g. wires.	**4**	Protected against water sprayed from any direction. Limited ingress permitted.
5	Limited protection against dust ingress (no harmful deposit)	**5**	Protected against low pressure water jets from any direction. Limited ingress permitted.
6	Totally protected against dust ingress.	**6**	Protected against high pressure water jets from any direction. Limited ingress permitted.
		7	Protected against temporary immersion between 15cm to 1m.
		8	Protected against long periods of immersion under pressure.

The 708M12 Industrial Ethernet Switches are fully protected against dust and will remain sealed when immersed in water to a depth of 1 meter for 1 hour when all the ports are properly mated or sealed.

These IP67 caps seal off the unused ports protecting them from dirt, water, oil or any other contaminants which might be present in the close proximity of the switch.

Please make sure the 708 Series Ethernet Switch package contains the following items:

1. 708M12 Switch
2. Product CD

Contact your carrier if any items are damaged.

Installation

Read the following warning before beginning the installation:

WARNING

Never install or work on electrical equipment or cabling during periods of lightning activity. Never connect or disconnect power when hazardous gasses are present.

Disconnect the power cable before removing any enclosure panel.

UNPACKING

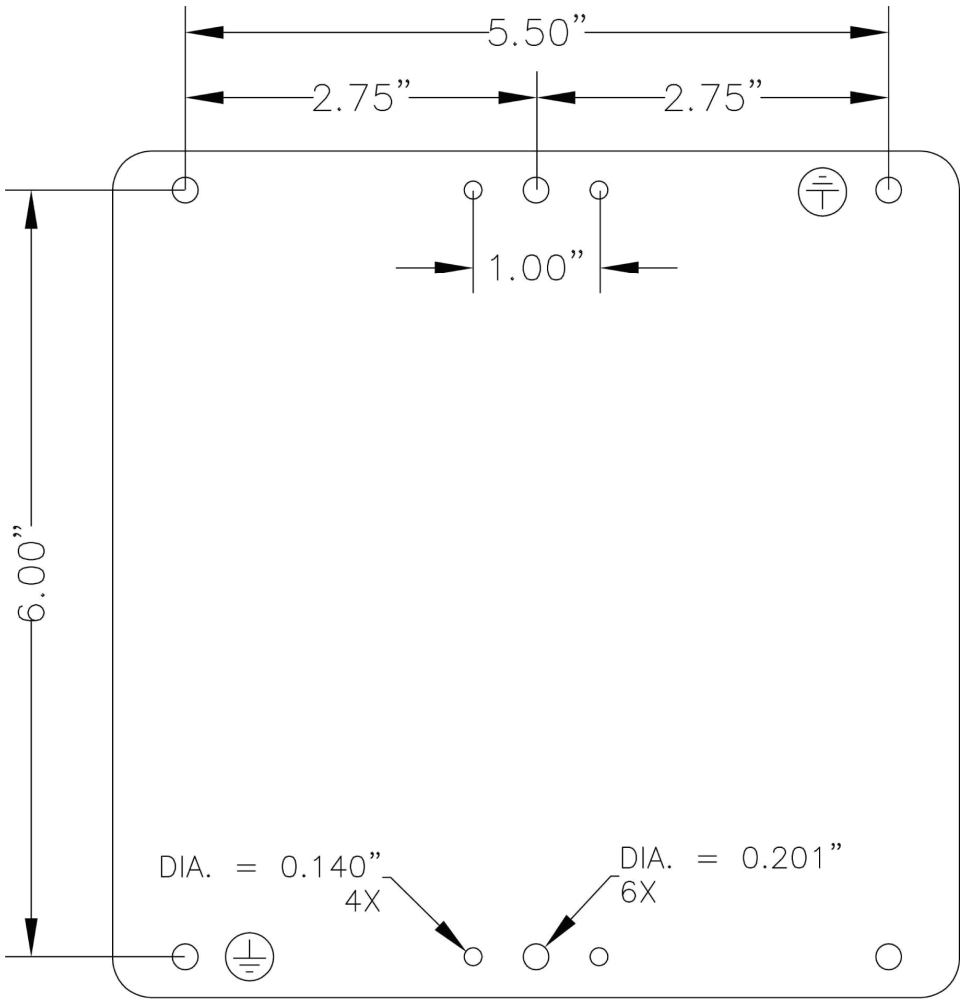
Remove all the equipment from the packaging, and store the packaging in a safe place. File any damage claims with the carrier.

CLEANING

Clean only with a damp cloth.

Bulkhead Mounting

The following are the mechanical dimensions and drill hole placements to consider when mounting the 708M12 Industrial Ethernet Switches:



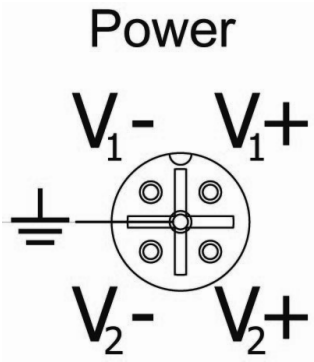
Front Panel

LNK/ACT	Link/Activity LED
M12 D-Coded Female Ports	All 8 ports are Auto sensing 10/100BaseTX
M12 A-Coded Male Port	Redundant Power Input (10-49VDC)
⏻	Green LED lights when Power is connected
M12 A-Coded Female Port	Serial COM Port (CLI)
M12 A-Coded Female Port	NTCD-M12 (N-Tron Configuration Dongle)

LED's: The table below describes the operating modes:

LED	Color	Description
⏻	GREEN	Power is Applied with no active faults.
	RED	Power is Applied with an active fault.
	OFF	Power is not Applied.
LNK	ON	Link established, no Activity on cable.
	OFF	No link established
ACT	BLINKING	Link established, Activity on cable
	OFF	No link established

Applying Power



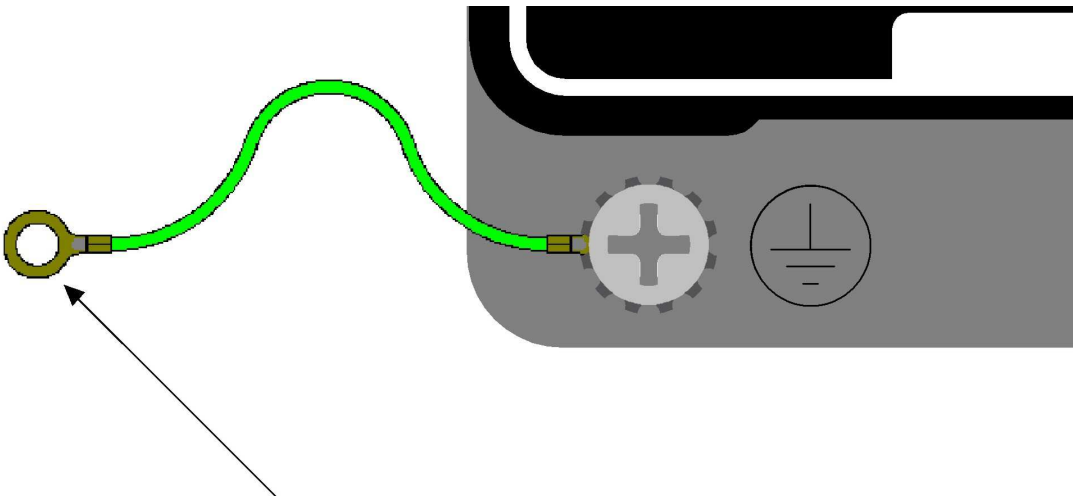
The M12 A coded power connector is keyed, where the mating connection from the power supply can be made only when the male and female ends are lined up properly.
When the power is first connected all LED's will flash ON Momentarily.
Verify the Power LED stays ON (GREEN).

Note: Either V_1 or V_2 can be connected to power for minimal operation. For redundant power operation, V_1 and V_2 must be connected to separate DC Voltage sources. The power cord should be limited to less than 10 meters in order to ensure optimum performance.

Recommended 24V DC Power Supplies, similar to:

100VAC/240VAC:

N-Tron NTPS-24-1.3, DC 24V/1.3A



Drain wire with lug connecting switch chassis to known grounding point.

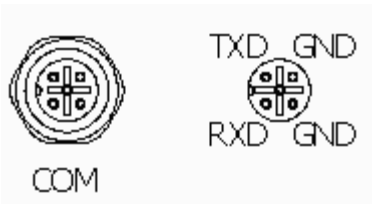
CONNECTING THE UNIT

For 10Base-T ports, plug a Category 3 (or greater) twisted pair cable into the M12 connector. For 100Base-T ports, plug a Category 5 (or greater) twisted pair cable into the M12 connector. Connect the other end to the far end station. Verify that the LNK LED's are ON once the connection has been completed. To connect any other port to another Switch or Repeater, use a standard Cat5 straight through or crossover cable.

Warning: Creating a port to port connection on the same switch (i.e. loop) is an illegal operation and will create a broadcast storm which will crash the network!

SERIAL INTERFACE

The 708M12 Switch provides an EIA-232 interface accessed via an A Coded female connector (labeled 'COM' on the unit). This is used to access the Command Line Interpreter (CLI). The pin-outs are shown below:



SERIAL-DB9-M12

Serial Cable

Connect the serial COM port of your PC and the 708M12 Switch using N-Tron's SERIAL-DB9-M12 serial cable. You will require a cable with a 9-pin or 25-pin sub-D female connector for the PC end, and a 4-Pin A Coded M12 Male connector for the 708M12 end.

The following table shows the pin-out and the connections for both types of cable:

PC Port	25-Pin Female	9-Pin Female	708M12 4-Pin A Coded M12 Male	
Signal Name	**Pin #**	**Pin #**	**Pin #**	**Signal Name**
TXD	2	3	2	RXD
RXD	3	2	1	TXD
GND	7	5	3/4	GND

HyperTerminal

The following configuration should be used in HyperTerminal:

Port Settings: **115200**
Data Bits: **8**
Parity: **NONE**
Stop bits: **1**
Flow Control: **NONE**

Overview of Advanced Features

Mode of Operation

Each port on the switch can be configured into different modes of operation as shown below:

Copper Ports:
- Half Duplex
- Full Duplex
- Auto Negotiation

Half Duplex

In half duplex mode, the CSMA/CD media access method is the means by which two or more stations share a common transmission medium. To transmit, a station waits (defers) for a quiet period on the medium (that is, no other station is transmitting) and then sends the intended message in bit-serial form. If, after initiating a transmission, the message collides with that of another station, then each transmitting station intentionally transmits for an additional predefined period to ensure propagation of the collision throughout the system. The station remains silent for a random amount of time (back-off) before attempting to transmit again.

Full Duplex

Full duplex operation allows simultaneous communication between a pair of stations using point-to-point media (dedicated channel). Full duplex operation does not require that transmitters defer, nor do they monitor or react to receive activity, as there is no contention for a shared medium in this mode.

Auto Negotiation

In Auto Negotiation mode, the port / hardware detects the mode of operation of the station that is connected to this port and sets its mode to match the mode that of the station.

Port Mirroring

A Mirroring Port is a dedicated port that is configured to receive the copies of Ethernet frames that are being transmitted out and also being received in from any other port that is being monitored.

Port Trunking

Port Trunking is the ability to group two network ports to increase the bandwidth between two machines (switch or any work station). This feature allows grouping of high-speed connectivity and provides redundant connection between switches, so that a trunk can act as a single link between the switches.

Priority Tagging (QoS)

IEEE 802.1p priority tagging is supported for two classes of services along with bandwidth support per priority level. Transparent mode is supported through configuration wherein if the field is set, the tag bits are ignored. The user can configure up to 8 different priority levels per port. Also priority overriding (overriding the tagged field) can be enabled or disabled by the user.

Virtual LAN

The switch provides support for setting up tagged Virtual LANs. A port may belong to any number of Virtual LANs. The VLAN membership of a station is determined by the VLAN(s) that have been defined for the port to which the station is connected. If a station should move from one port to another, it loses its current VLAN membership and inherits that of the new port it is connected to.

A Default Virtual LAN exists to which a port, which is not a member of any other Virtual LAN, will belong. This allows the switch to operate as a 'normal' Bridge when it is used in a network. A port is automatically removed from the Default VLAN when it is reconfigured to belong to another Virtual LAN.

Using Tagged VLANs, the switch has the ability to take non-tagged packets in some ports, add a VLAN tag to the packet and send it out tagged ports on the switch. The VLANs can also be configured to accept tagged packets in tagged ports, strip the tags off the packets, and send the packets back out other untagged ports. This allows a network administrator to set up the switch so he can support devices on the network that do not support VLAN Tagged packets. The administrator can also set up the ports to discard any packets that are tagged or to discard any packets that are untagged based on a hybrid VLAN of both tagged and untagged ports, and using the VLAN Ingress Filter on the switch.

The 708 Series switch also has the ability to allow overlapping VLANs. Overlapping VLANs give the user the ability to have one or more ports share two or more VLAN groups. For more information and examples on how this could be implemented, please see our website's technical documents.

Rapid Spanning Tree Protocol

The Rapid Spanning Tree Protocol as specified in IEEE 802.1D-2004 is supported. One Spanning Tree per non-overlapping VLAN is supported. The Rapid Spanning Tree Protocol (RSTP) supersedes the Spanning Tree Protocol (STP) which was described in IEEE 802.1D-1998. The RSTP is used to configure a simply connected active network topology from the arbitrarily connected bridges of a bridged network. Bridges effectively connect just the LANs to which their forwarding ports are attached. Ports that are in a blocking state do not forward frames. The bridges in the network exchange sufficient information to automatically derive a spanning tree.

RSTP allows for much quicker learning of network topology changes than the older STP. RSTP supports new and improved features such as rapid transition to forwarding state. RSTP also sends out new BPDUs every hello time instead of just relaying them. RSTP interoperates with older STP switches by falling back to the older STP when the older BPDUs are detected on bridge ports. The user can also manually configure bridge ports to use the older STP when desired.

SNMP Traps

The 708 Series switch supports up to 5 SNMP Trap Stations to which SNMP Traps will be sent. The switch supports four standard traps; Link Up, Link Down, Cold Start and Warm Start. SNMP Traps will be sent to all the stations configured on the switch if a port Link goes up or down, when the switch first powers up and when the switch is reset.

IGMP Snooping

IGMP Snooping is enabled by default, and the switch is *Plug and Play* for IGMP. IGMP snooping provides intelligent network support for multicast applications. In particular, unneeded traffic is reduced. IGMP

Snooping is configured via the web console and if enabled, operates dynamically upon each power up. Also, there can be manual only or manual and dynamic operation. Note that “static multicast group address” can be used whether IGMP Snooping is enabled or not.

IGMP Snooping will function dynamically without user intervention. If some of the devices in the LAN do not understand IGMP, then manual settings are provided to accommodate them. The Internet Group Management Protocol (IGMP) is a protocol that provides a way for a computer to report its multicast group membership to adjacent ‘routers’. In this case N-Tron 708 series switches provide *router-like functionality*. Multicasting allows one computer to send content to multiple other computers that have identified themselves as interested in receiving the originating computer's content. Multicasting can be used to transmit only to an audience that has joined (and not left) a multicast group membership. IGMP version 2 is formally described in the Internet Engineering Task Force (IETF) Request for Comments (RFC) 2236. IGMP version 1 is formally described in the Internet Engineering Task Force (IETF) Request for Comments (RFC) 1112. The 708 series supports v1 and v2.

N-Ring

N-Ring is enabled by default, and the switch is *Plug and Play* for N-Ring except that initially one must enable an N-Ring enabled device to be the N-Ring Manager for a given N-Ring. Subsequently, N-Ring operates dynamically upon each power up. Using N-Tron's proprietary N-Ring technology offers expanded ring size capacity, detailed fault diagnostics, and a standard healing time of 30ms. The N-Ring Manager periodically checks the health of the N-Ring via health check packets. If the N-Ring Manager stops receiving the health check packets, it times out and converts the N-Ring to a backbone within 30ms. When using all N-Ring enabled switches in the ring, a detailed ring map and fault location chart is also provided on the N-Ring Manager’s web browser. N-Ring status is also sent from the N-Ring Manager to the N-View OPC Server to identify the health status of the ring. Up to 250 N-Ring enabled switches can participate in one N-Ring topology. Switches that do not have N-Ring capability may be used in an N-Ring, however the ring map and fault location chart cannot be as detailed at these locations.

TROUBLESHOOTING

1. Make sure the ⏻ (Power LED) is ON.
2. Make sure you are supplying sufficient current for the version chosen. Note: The Inrush current will exceed the steady state current by ~ 2X.
3. Verify that Link LEDs are ON for connected ports.
4. Verify cabling used between stations.
5. Verify that cabling is Category 5E or greater for 100Mbit operation.

SUPPORT

Contact N-Tron Corp. at:
TEL: 251-342-2164
FAX: 251-342-6353
E-MAIL: N-TRON_Support@n-tron.com
WEB: www.n-tron.com

FCC STATEMENT

This product complies with Part 15 of the FCC-A Rules.
Operation is subject to the following conditions:
(1) This device may not cause harmful Interference
(2) This device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this device in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his/her own expense.

INDUSTRY CANADA

This Class A digital apparatus meets all requirements of the Canadian Interference Causing Equipment Regulations. Operation is subject to the following two conditions; (1) this device digital apparatus meets all requirements of the Canadian Interference Causing Equipment Regulations. Operation is subject to the following two conditions; (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Cet appareillage numérique de la classe A répond à toutes les exigences de l'interférence canadienne causant des règlements d'équipement. L'opération est sujette aux deux conditions suivantes: (1) ce dispositif peut ne pas causer l'interférence nocive, et (2) ce dispositif doit accepter n'importe quelle interférence reçue, y compris l'interférence qui peut causer l'opération peu désirée.

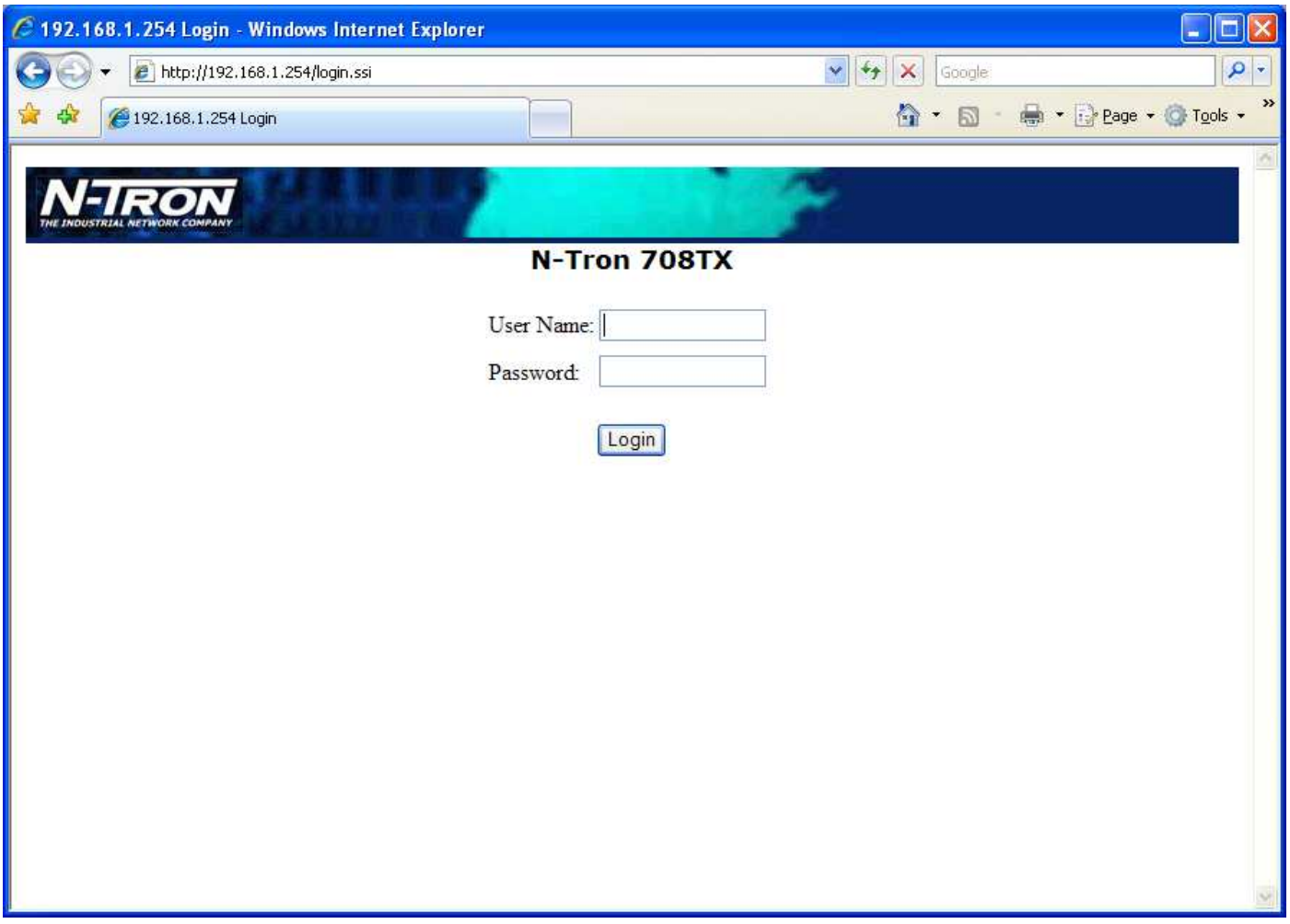
Web Software Configuration

Web Management

Enter the switch's IP address in any web browser and login to the web management feature of the 708 Series.

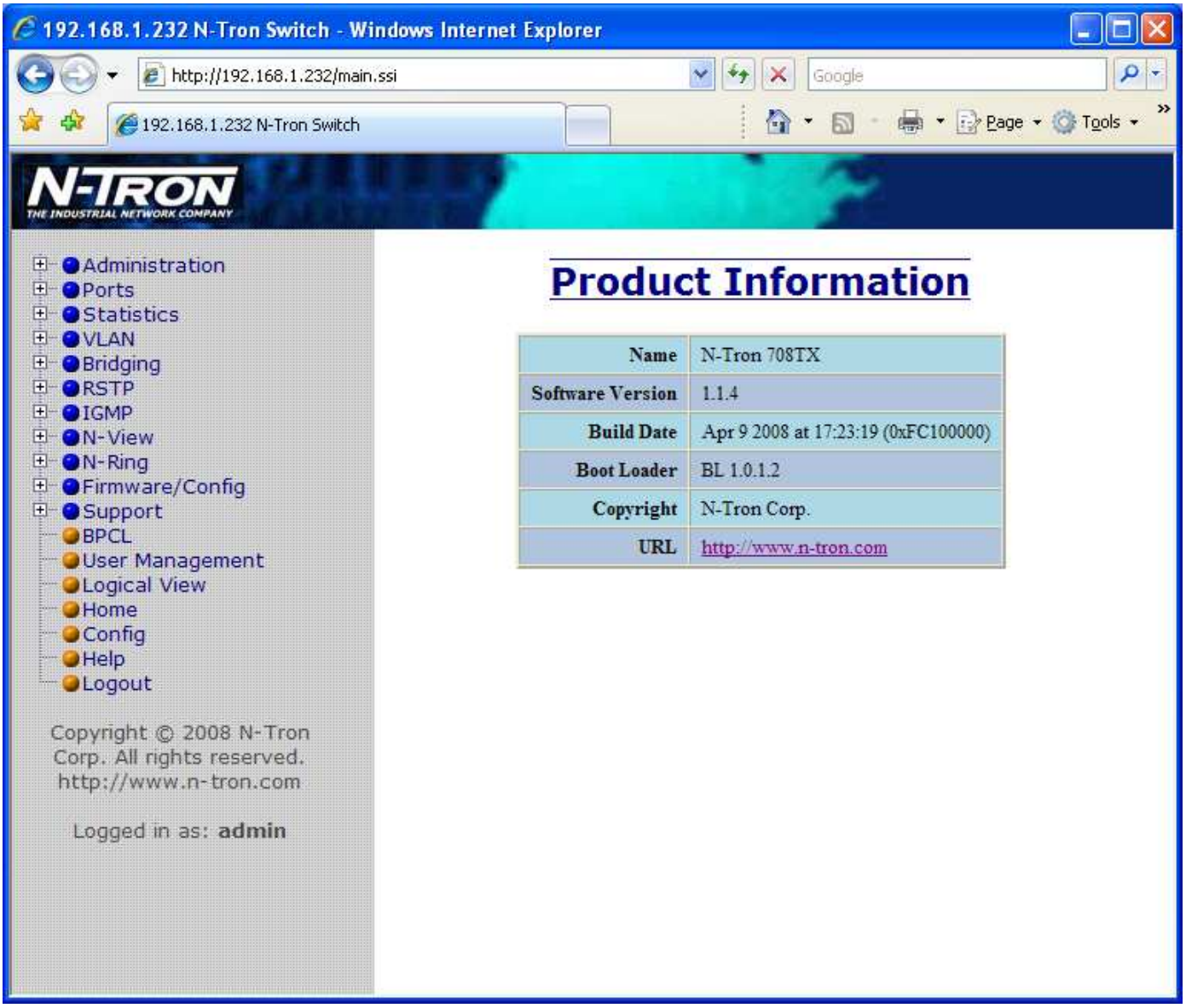
Default:

User Name: ***admin***
Password: ***admin***



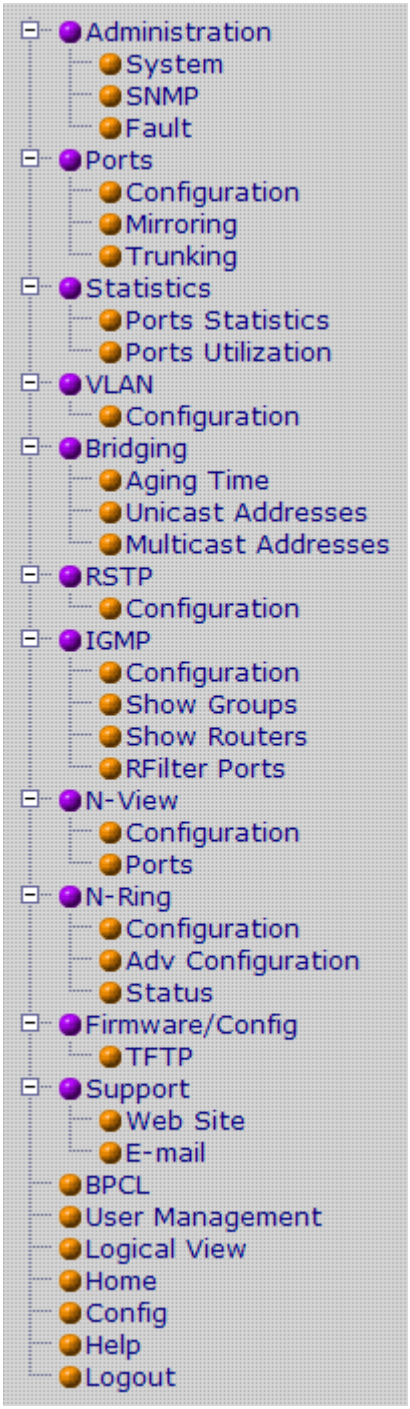
Web Management - Home

When the administrator first logs onto a 708 Series switch the default home page will be displayed. On the left hand side of the screen there is a list of configurable settings that the 708 Series switch will support. This section of the manual will go through each and every choice listed on the left hand side of the screen and explain how to configure those settings. In the center of the main home page the administrator can see some basic information like what firmware revision the switch is running. The firmware can be upgraded at a later time in the field using TFTP.



Web Management – Menu Structure

To the left, there is a menu which is shown fully opened below. The pages opened by each of the individual selections are described in the rest of this section. The use of each of these pages is also described in this section. In most of the descriptions, only the right side of the page is shown.



Administration – System

The System tab under the Administration category lists the following information about the switch:

IP Address
Contains the configured IP Address of the device.

Subnet Mask
Contains the configured Subnet Mask of the device.

Gateway
Contains the configured Default Gateway of the device.

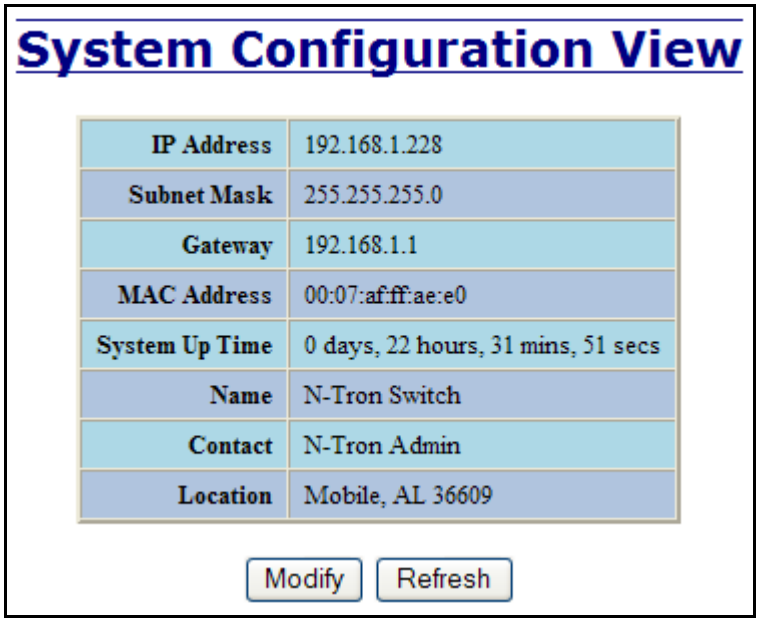
MAC Address
MAC Address of the device.

System Up Time
This parameter represents the total time count. This time has elapsed since the switch was turned ON or RESET.

Name
It shows the name of the product, which allows alphanumeric and special characters (#, _, -) only.

Contact
The person to contact for system issues, which should be someone within your organization.

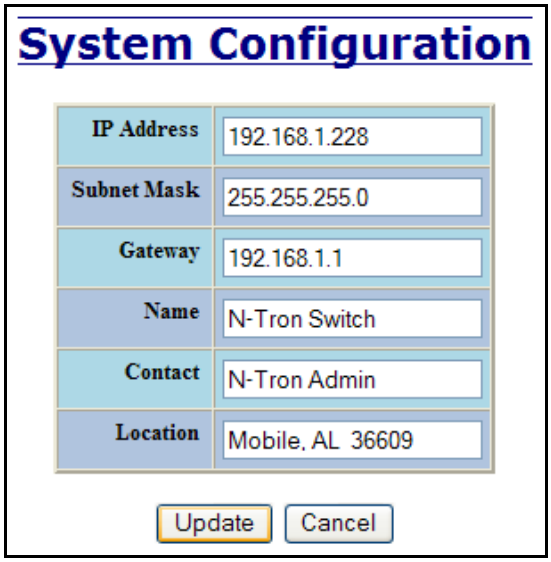
Location
The physical location of the switch.



Administration – System, Continued…

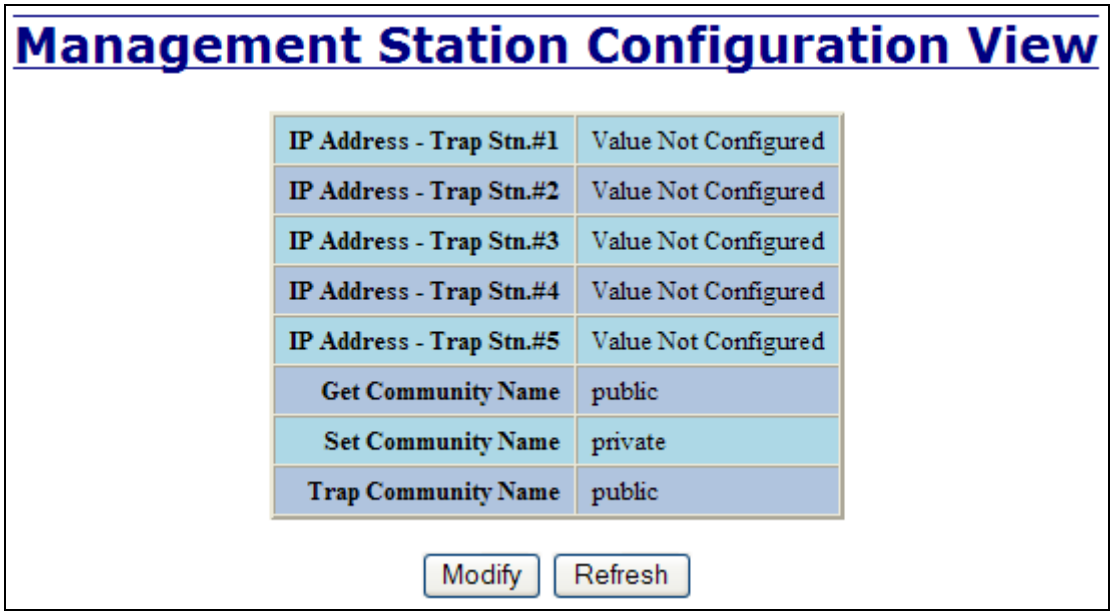
By selecting the Modify button, you will be able to change the switch's IP Address, Subnet Mask, Gateway, Name, Contact information, and the Location of the switch through the web management features. It is recommended to change the TCP/IP information through the Command Line Interface (CLI) initially, but it defaults to the following:

IP Address – 192.168.1.201
Subnet Mask – 255.255.255.0
Gateway – 192.168.1.1

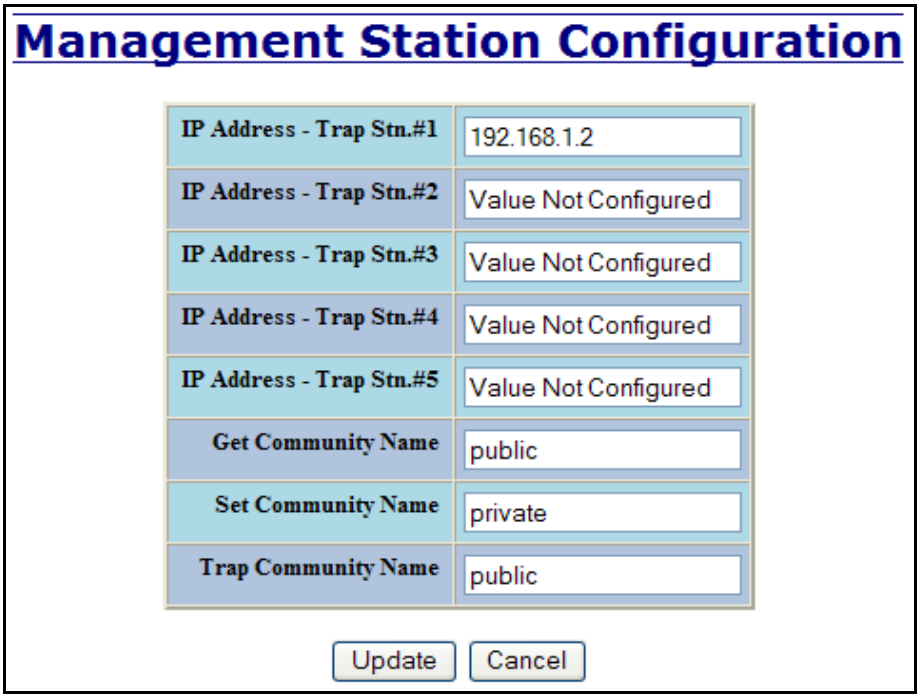


Administration – SNMP

The SNMP tab under the Administration category shows a list of IP Addresses that act as SNMP Traps. The Get, Set, and Trap Community Names are also shown here.

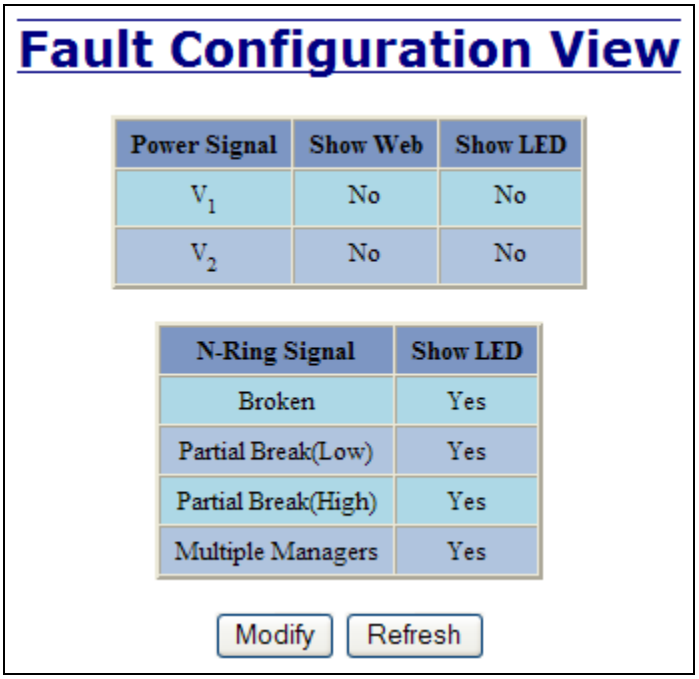


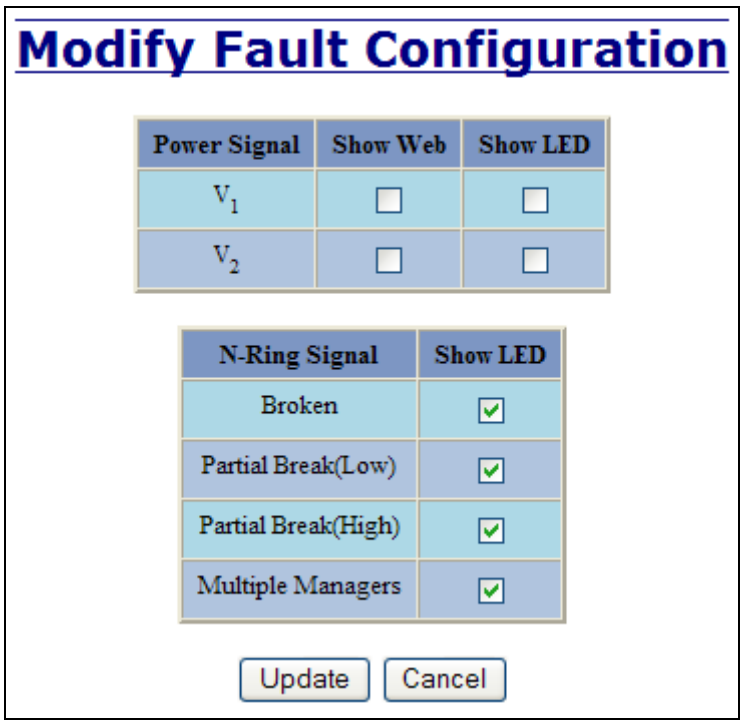
By selecting the Modify button, you will be able to change any of the fields listed. This allows the user to set an IP address for an SNMP Trap or change the Community Names. Systems that are listed as an SNMP Trap will be sent basic networking changes made to the switch such as ports going down or being linked. To restore a Trap to "Value Not Configured", enter '0.0.0.0'.



Administration – Fault

The Fault tab under the Administration category provides configurable selections indicating the way to notify when a Power or N-Ring Signal fault occurs. Power signal faults consist of V_1 and V_2. The notification may consist of any combination of the options: Show web, and Show LED. N-Ring signal faults consist of: Broken, Partial Break (Low), Partial Break (High), and Multiple Managers.





The Configuration tab under the Ports category will show a detailed overview of all the active ports on the switch. The overview will display the following information:

Port Number
This is the port index.

Port Name
This field displays the name of the port. The designation of TX is for copper ports and FX is for fiber optic ports.

Admin Status
This configurable field displays the existing status of the port whether it is **Enabled/Disabled.**

Link Status
Current Link state of the port.

Auto Negotiation State
This configurable field displays the current auto-negotiation state whether it is **Enabled/Disable.**

Port Speed
This configurable field displays the speed of each port **10/100** Mbps.

Duplex Mode
This configurable field displays the existing mode of the port whether it is **Full Duplex/Half Duplex.**

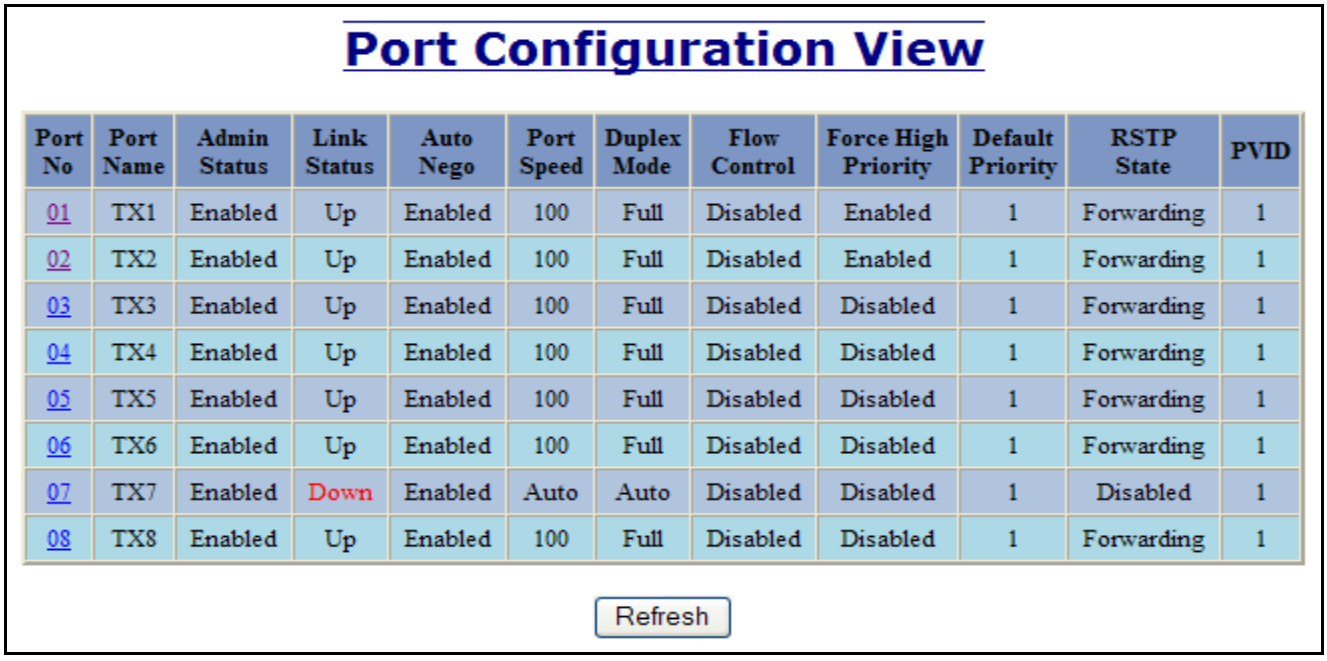
Flow Control State
This configurable field displays the existing flow control status of each port. When enabled, the individual port supports half-duplex back pressure and full-duplex flow control. The default is **Disabled.**

Force High Priority State
This configurable field displays the port priority status of each port. When enabled for a port all frames received on that port will be forced to the highest priority queue regardless of 'Default Priority' setting or priority tags within the received frames. The default is **Disabled**. In an untagged N-Ring configuration, the N-Ring ports on the N-Ring Manager and active N-Ring Members will be **Enabled**.

Default Priority
This configurable field displays the default QoS priority for the port when an untagged frame is received. The range is **0-7.**

RSTP State
The current RSTP status of a port. It may contain **Disable/Discarding/Learning/Forwarding.**

PVID
This configurable field displays the existing port VLAN ID setting. The allowable range is **1-4094.**



Port Configuration View

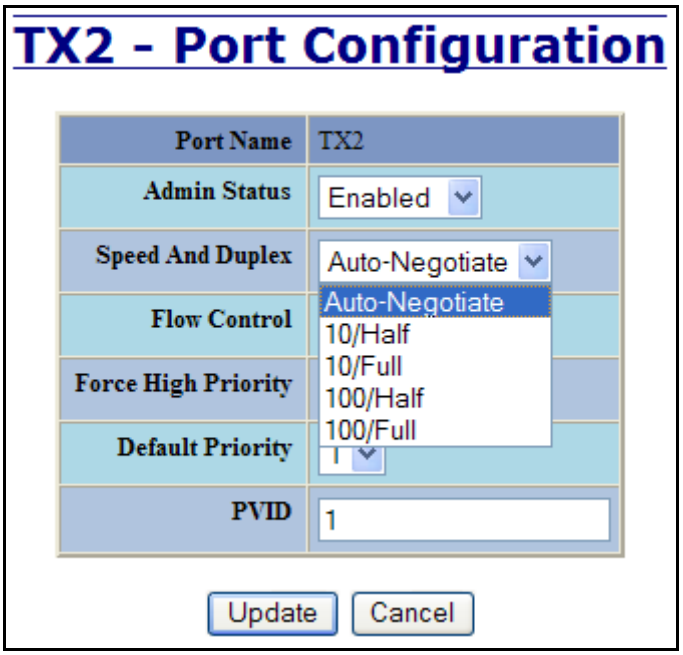
Port No	Port Name	Admin Status	Link Status	Auto Nego	Port Speed	Duplex Mode	Flow Control	Force High Priority	Default Priority	RSTP State	PVID
01	TX1	Enabled	Up	Enabled	100	Full	Disabled	Enabled	1	Forwarding	1
02	TX2	Enabled	Up	Enabled	100	Full	Disabled	Enabled	1	Forwarding	1
03	TX3	Enabled	Up	Enabled	100	Full	Disabled	Disabled	1	Forwarding	1
04	TX4	Enabled	Up	Enabled	100	Full	Disabled	Disabled	1	Forwarding	1
05	TX5	Enabled	Up	Enabled	100	Full	Disabled	Disabled	1	Forwarding	1
06	TX6	Enabled	Up	Enabled	100	Full	Disabled	Disabled	1	Forwarding	1
07	TX7	Enabled	Down	Enabled	Auto	Auto	Disabled	Disabled	1	Disabled	1
08	TX8	Enabled	Up	Enabled	100	Full	Disabled	Disabled	1	Forwarding	1

Refresh

Ports – Configuration, Continued…

The User can click on the Port Number to configure each port individually. This will allow the user to change the port's settings for the following fields which are explained above:

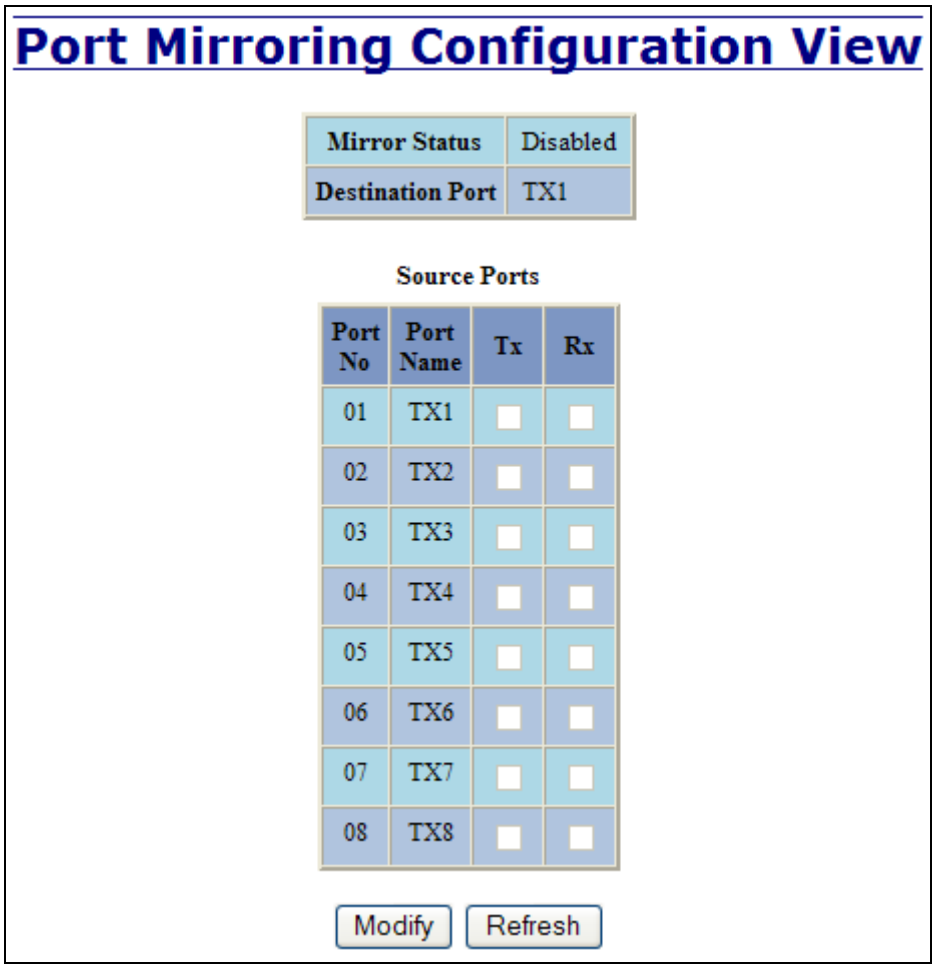
Admin Status
Speed and Duplex
Flow Control
Force High Priority
Default Priority
PVID



Ports – Mirroring

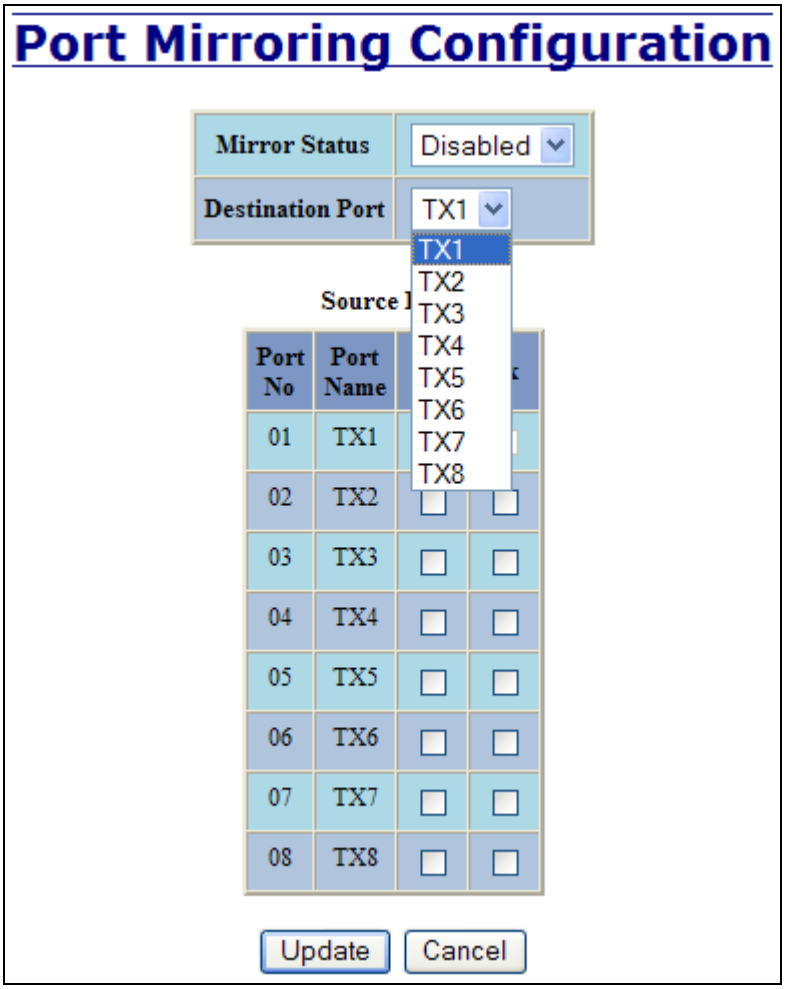
A mirroring port is a dedicated port that is configured to receive the copies of Ethernet frames that are being transmitted out and also being received in from any other port that is being monitored.

The Mirroring tab under the Ports category displays the status including the list of Source Ports and the Destination Port that the Sources are being mirrored to.



Ports – Mirroring, Continued…

Following the Modify button, you can enable the status of port mirroring and select source ports and the destination port that the source ports will be mirrored to.



Ports – Trunking

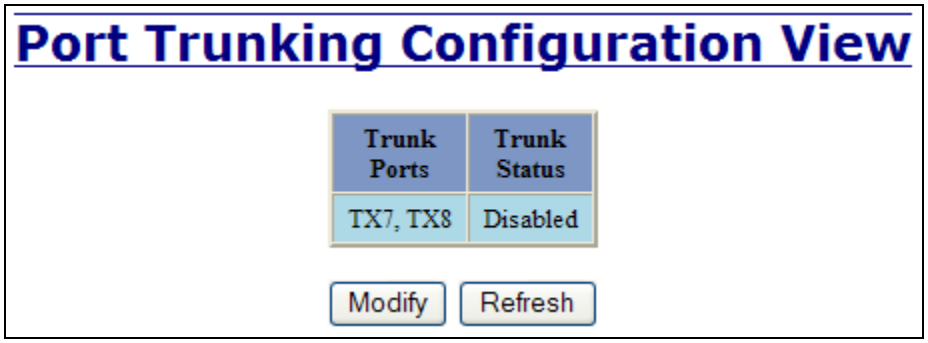
The Trunking tab under the Ports category displays the following details:

Trunk Ports

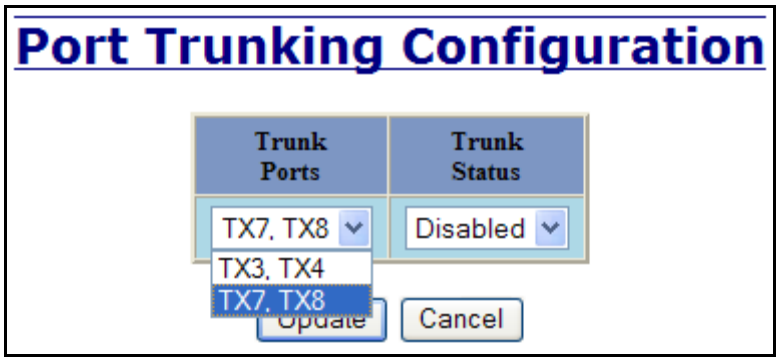
This field displays the ports associated with the trunk.

Trunk Status

This configurable field displays the existing status of the trunk. It can be either Enabled/Disabled.



By selecting the Modify button, you can select a trunk group.



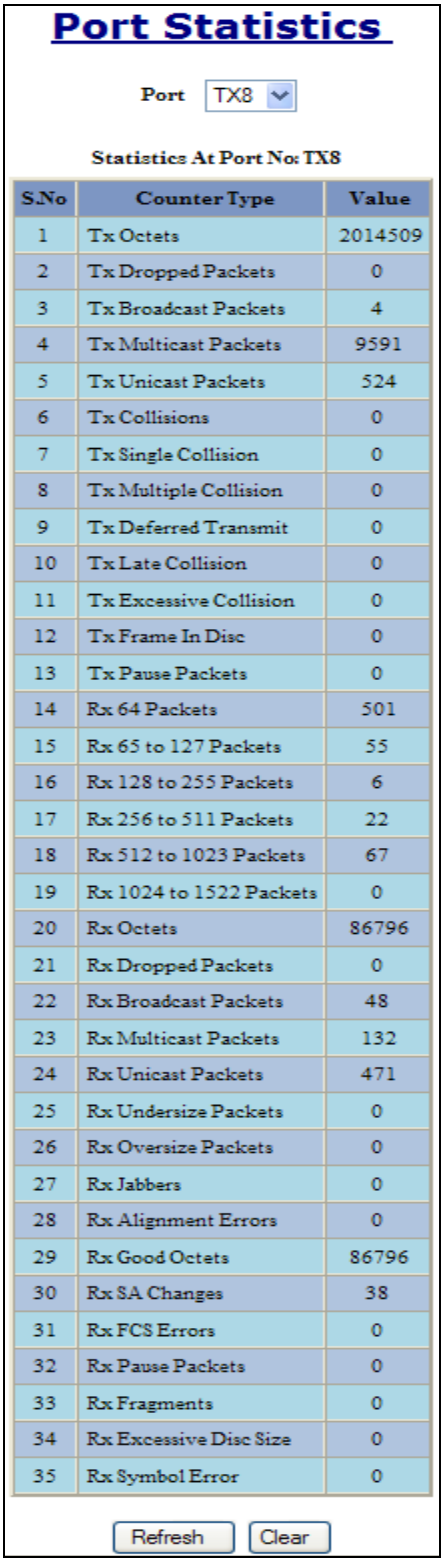
Note: *RSTP must be disabled in order to use the Trunking feature.*
Two ports of the same speed can constitute a valid trunk.
Only 1 Trunk per switch can be created.

All trunk ports must be at the same speed and duplex mode. If a port is not linked, there could be difficulty as to similar speed and duplex mode. It is best to hard code speed and duplex mode for each trunking link, at both ends.

Do not use Trunking on an N-Ring manager. Do not connect the N-Ring to actively Trunking ports on an Auto Member.

Statistics – Port Statistics

The Ports Statistics tab under the Statistics category displays a list of MIB parameters. Each port has a separate counter for each parameter. This gives users the ability to see what kind of packets are going over which ports. At the bottom of the page for each port there are two buttons. Refresh will update the statistics for that port number and Clear will reset all the counters for that port number.



Port Statistics

Port TX8

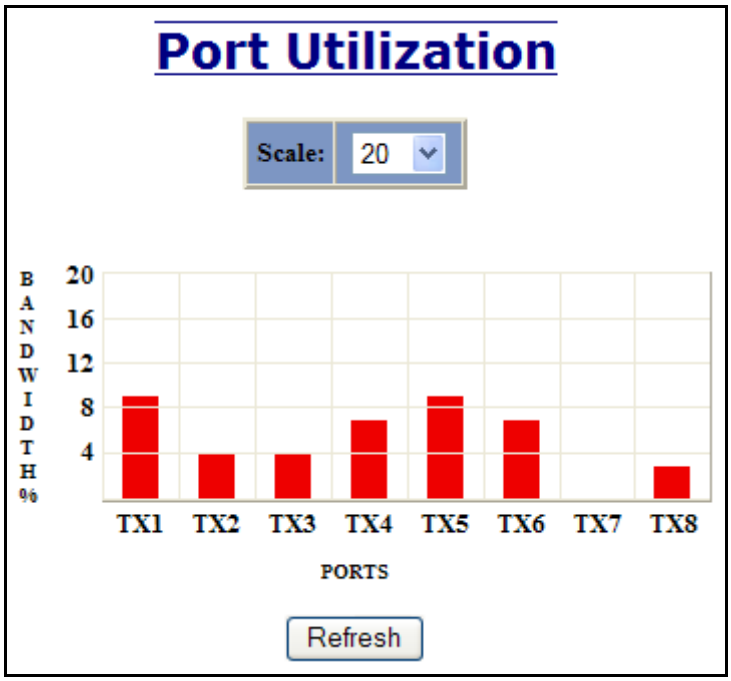
Statistics At Port No: TX8

S.No	Counter Type	Value
1	Tx Octets	2014509
2	Tx Dropped Packets	0
3	Tx Broadcast Packets	4
4	Tx Multicast Packets	9591
5	Tx Unicast Packets	524
6	Tx Collisions	0
7	Tx Single Collision	0
8	Tx Multiple Collision	0
9	Tx Deferred Transmit	0
10	Tx Late Collision	0
11	Tx Excessive Collision	0
12	Tx Frame In Disc	0
13	Tx Pause Packets	0
14	Rx 64 Packets	501
15	Rx 65 to 127 Packets	55
16	Rx 128 to 255 Packets	6
17	Rx 256 to 511 Packets	22
18	Rx 512 to 1023 Packets	67
19	Rx 1024 to 1522 Packets	0
20	Rx Octets	86796
21	Rx Dropped Packets	0
22	Rx Broadcast Packets	48
23	Rx Multicast Packets	132
24	Rx Unicast Packets	471
25	Rx Undersize Packets	0
26	Rx Oversize Packets	0
27	Rx Jabbers	0
28	Rx Alignment Errors	0
29	Rx Good Octets	86796
30	Rx SA Changes	38
31	Rx FCS Errors	0
32	Rx Pause Packets	0
33	Rx Fragments	0
34	Rx Excessive Disc Size	0
35	Rx Symbol Error	0

Refresh Clear

Statistics – Port Utilization

The Ports Utilization tab under the Statistics category shows all the ports on the switch and will display a bar graph showing the percentage of bandwidth being used. These figures and bars are for a general feeling of what the bandwidth usage is. N-Tron recommends the use of N-View in order to get a precise bandwidth usage figure.

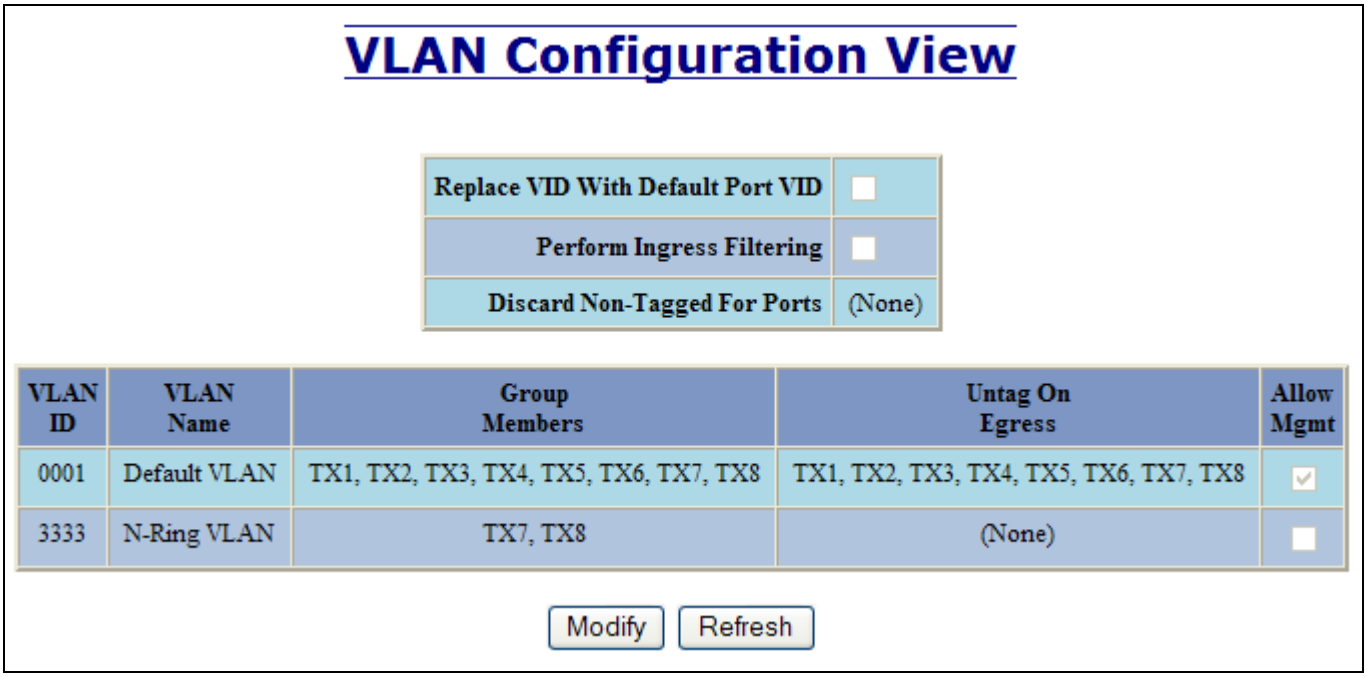


VLAN – Configuration

Replace VID Tag with Default Port VID
Specifies whether or not to replace the incoming VID tag with the port's designated VID.

Perform Ingress Filtering
Specifies whether or not to filter out ingress frames when a VID violation is detected.

Discard Non-Tagged for Ports
Specifies whether or not non-tagged ingress frames are dropped by the selected ports.



VLAN Configuration

Replace VID Tag With Default Port VID	☐
Perform Ingress Filtering	☐
Discard Non-Tagged For Ports	☐ TX1 ☐ TX2 ☐ TX3 ☐ TX4 ☐ TX5 ☐ TX6 ☐ TX7 ☐ TX8
Update Cancel	

VLAN Groups

VLAN ID	VLAN Name	Group Members	Untag On Egress	Allow Mgmt	Delete
0001	Default VLAN	TX1, TX2, TX3, TX4, TX5, TX6, TX7, TX8	TX1, TX2, TX3, TX4, TX5, TX6, TX7, TX8	☑	
3333	N-Ring VLAN	TX7, TX8	(None)	☐	Delete
Add					

Done Refresh

VLAN – Group Configuration

VLAN ID
This field displays the VLAN ID. The range should be **1-4094.**

VLAN Name
This configurable field displays the name of the VLAN, which accepts alphanumeric and special characters (#, _, -, .) only.

Allow Management
Specifies whether or not all ports in this VLAN are management ports.

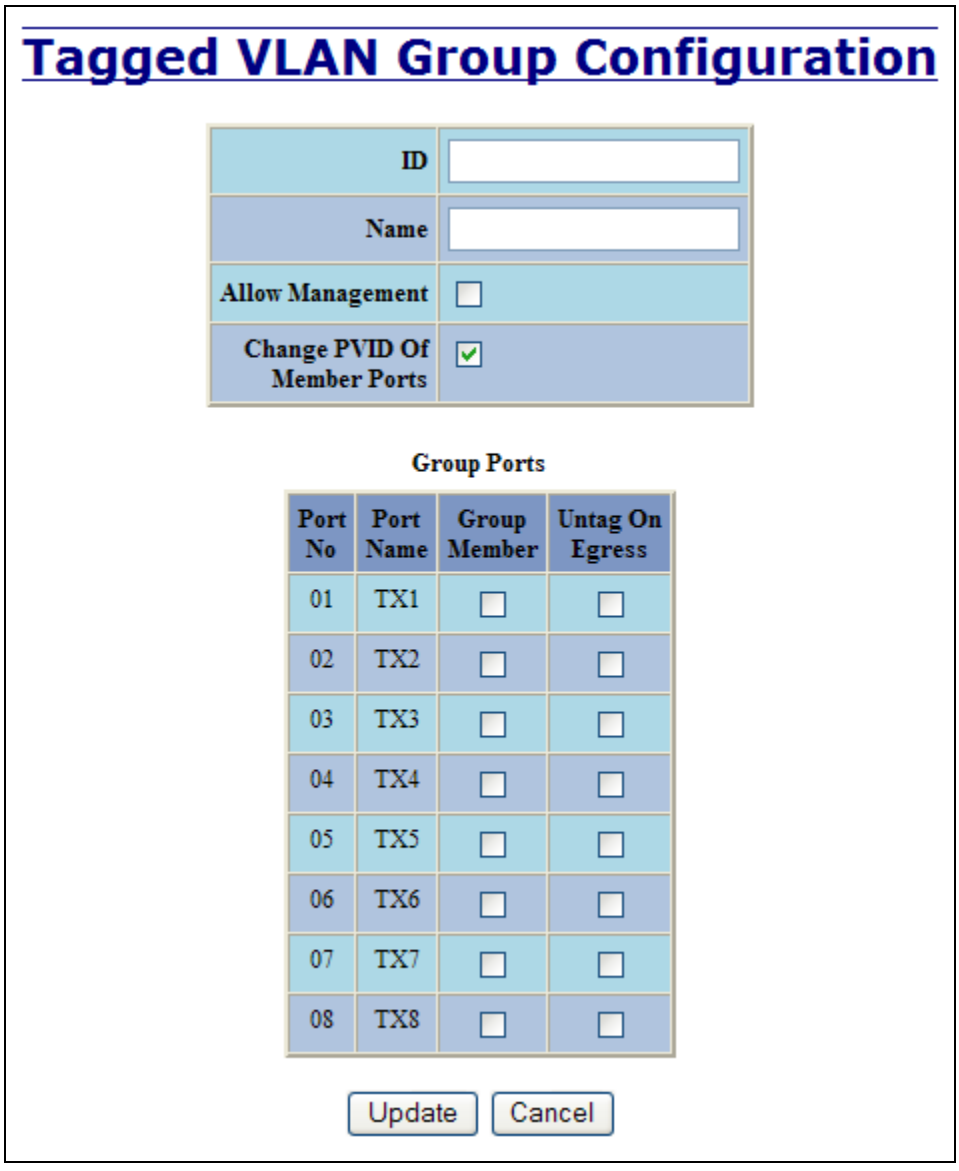
Change PVID of Member Ports
Specifies whether or not the PVID of the member ports is set to this VLAN ID.

Port No
This is the port index.

Port Name
Descriptive name of the port

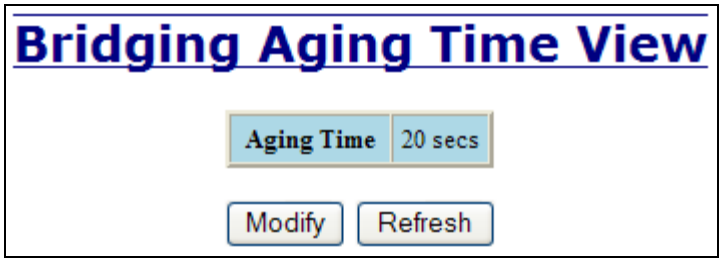
Group Member
Specifies whether or not the port is included in the group.

Untag on Egress
Specifies whether or not egress frames are tagged by the designated port.



Bridging – Aging Time

The Aging Time tab under the Bridging category will display the currently configured Aging Time. This page allows users to modify this variable to meet their needs.

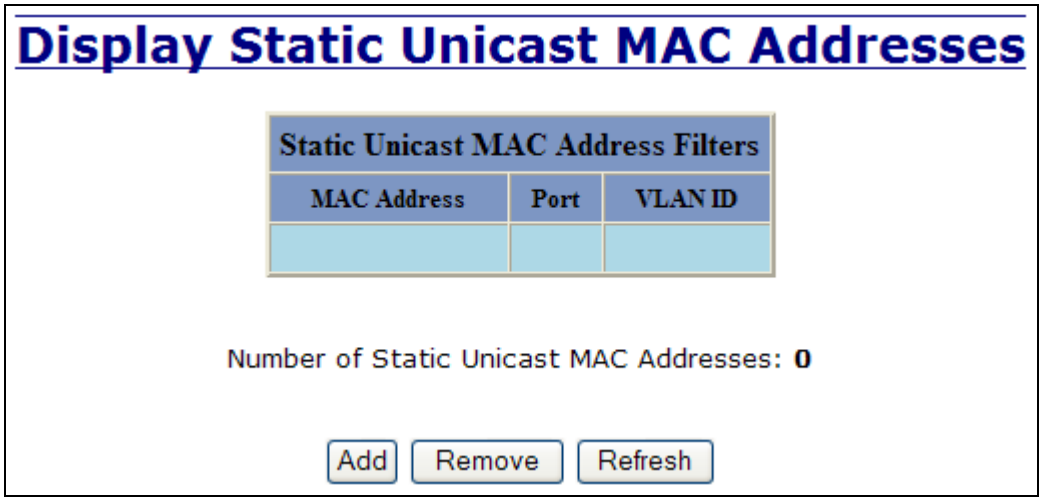


After selecting the Modify button, the user will be presented with a page that allows the number to be entered into and updated. The default aging time is 20 seconds.

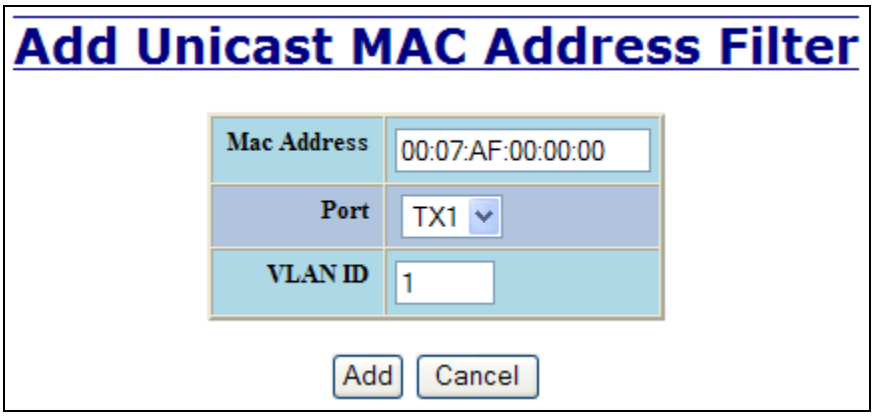
Note: *If the switch is an active participant of an N-Ring, then the N-Ring Aging Time will be used instead of the Bridging Aging Time.*

Bridging – Unicast Addresses

The Unicast Addresses tab under the Bridging category will display a list of MAC addresses that are associated with each respective port number. This can be used to statically assign a MAC address access to a single port on the switch.

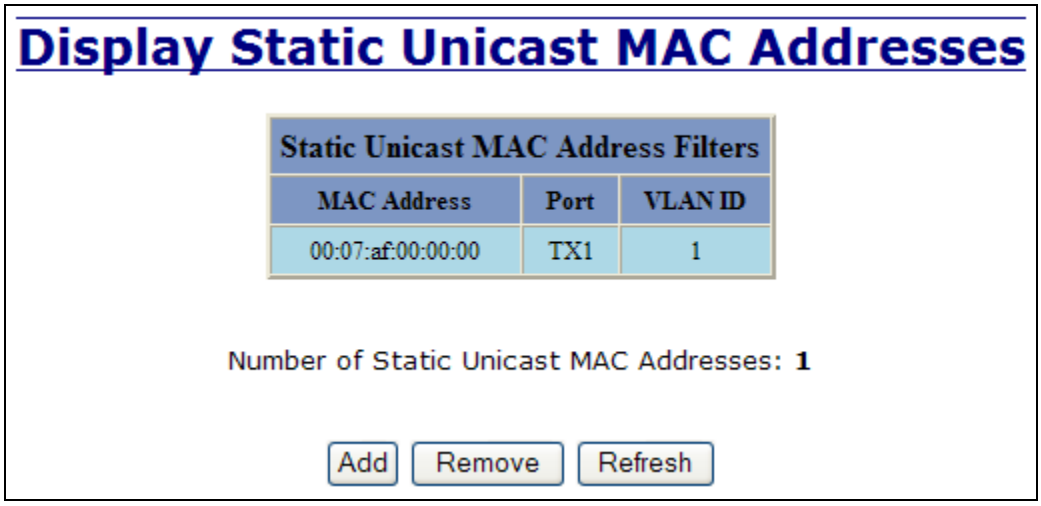


Following the Add button on the page above, the administrator must enter a valid MAC address and associate it with a port number on the switch. Once the administrator hits the Add button, the changes will take effect instantly.

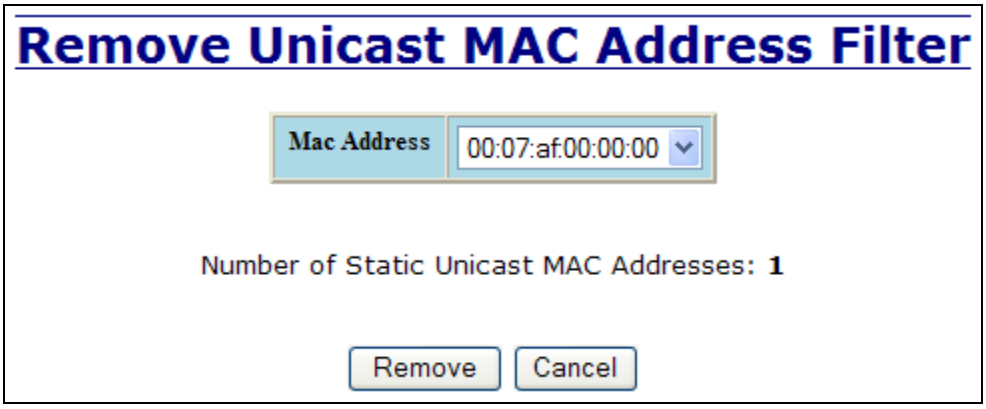


Bridging – Unicast Addresses, Continued…

Once a static MAC address has been added, it will be displayed in a list on the main page under Unicast MACs tab.

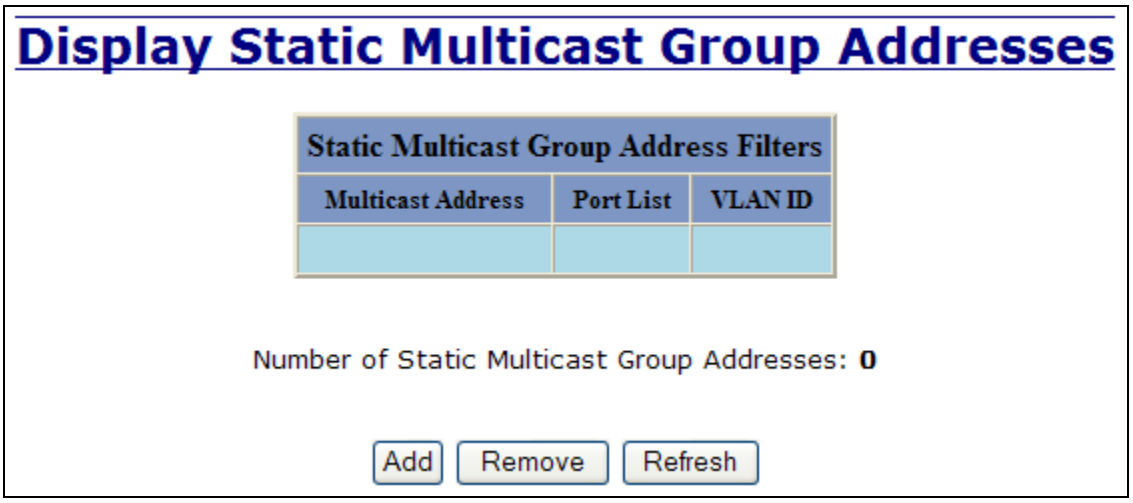


Following the Remove button on the example above, an administrator can select a static MAC address from the list using a pull-down menu. After selecting the MAC address, the administrator needs to press the Remove button on the page to remove the entry

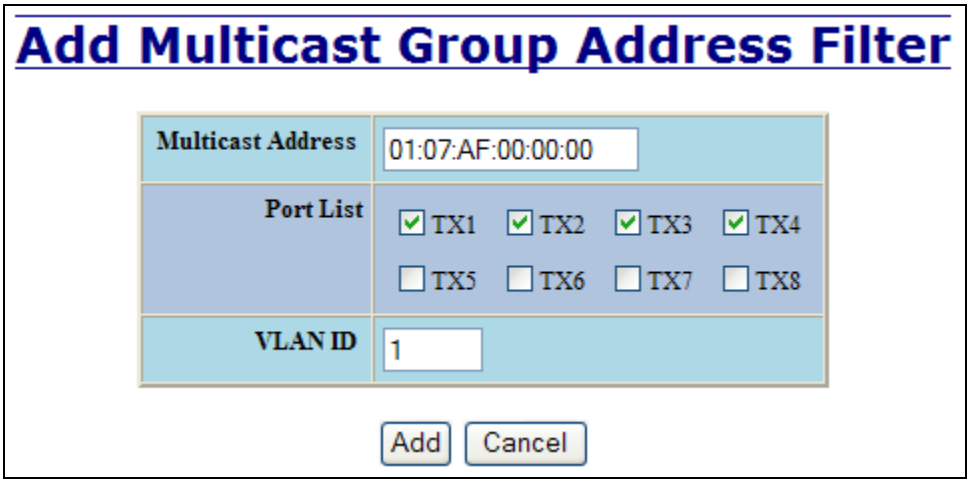


Bridging – Multicast Addresses

The Multicast Addresses tab under the Bridging category will display a list of Multicast Group Addresses that are associated with respective port numbers. This may be used to statically assign a Multicast Group Address access to a group of ports on the switch.



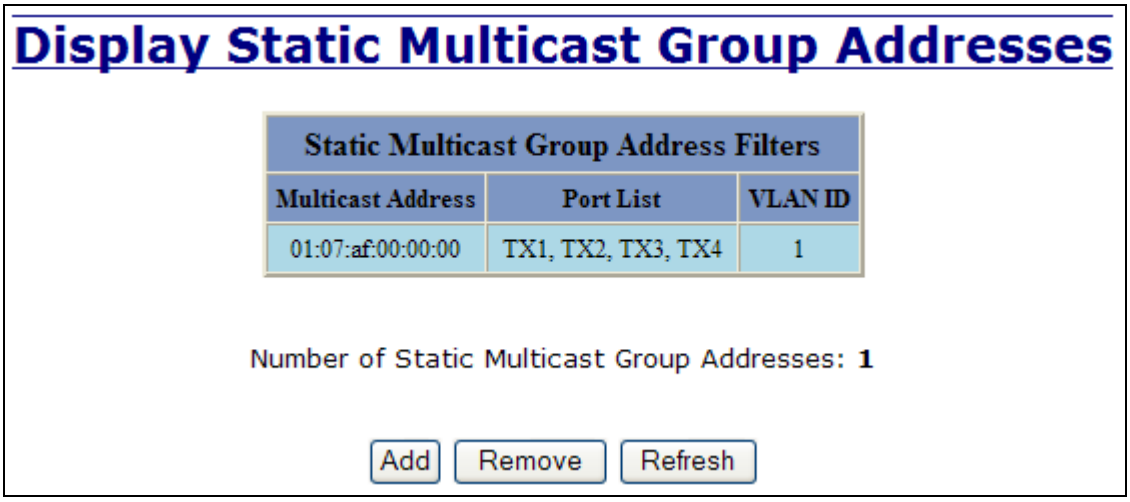
Following the Add button on the page above, the administrator must enter a valid Multicast Group Address and associate it with a port number or list on the switch. Once the administrator clicks on the Add button, the changes will take effect instantly.



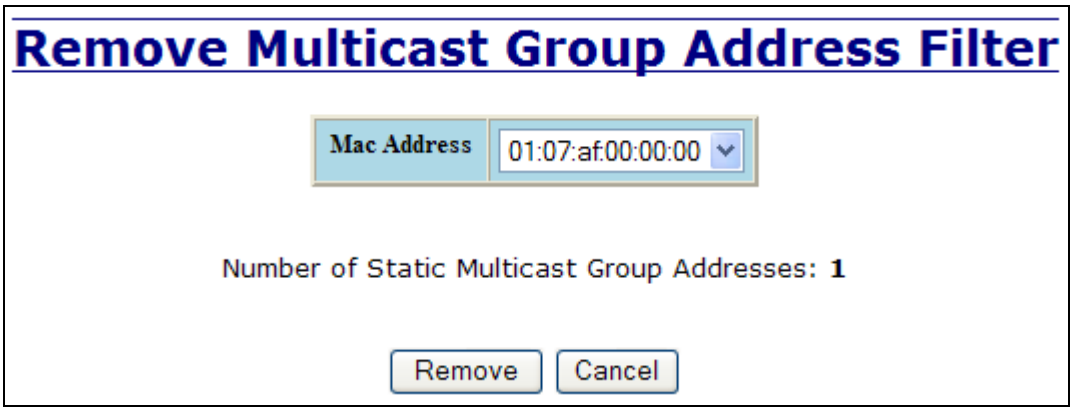
Note: *If there are multiple ports on different VLANs, the 708 will apply the static multicast address to the lowest VLAN-ID that is associated with one of the ports assigned to the static multicast address. So if the lowest VLAN-ID contains all the ports assigned to the static multicast address (an umbrella VLAN), it will function for all those ports with no problems. This can be achieved with overlapping VLANs.*

Bridging – Multicast Addresses Continued…

After adding a Multicast Group Address, it will appear on the main list and will show the associated ports that go along with that address.



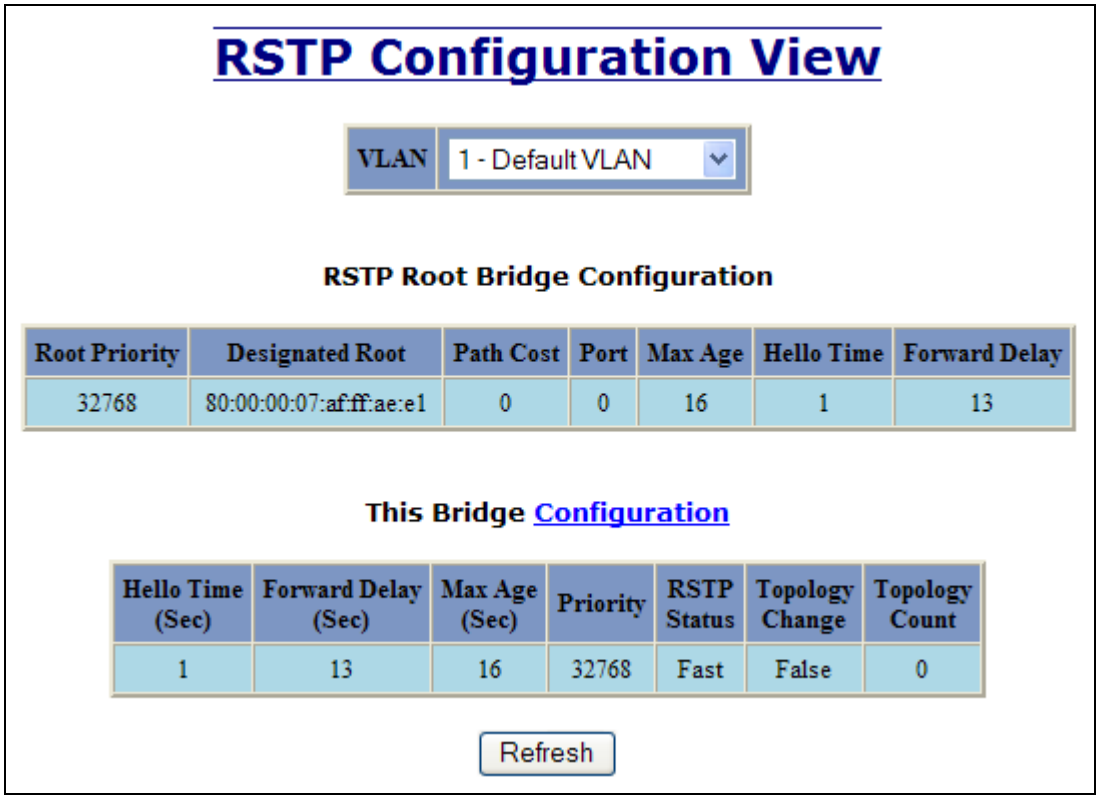
Following the Remove button on the example above, the administrator will be presented with a list of Multicast Group Addresses that are configured on the switch. Using the pull-down menu, the administrator should select the desired address to be removed. Then click on the Remove button at the bottom of the page.



Note: *If there are multiple ports on different VLANs, the 708 will apply the static multicast address to the lowest VLAN-ID that is associated with one of the ports assigned to the static multicast address. So if the lowest VLAN-ID contains all the ports assigned to the static multicast address (an umbrella VLAN), it will function for all those ports with no problems. This can be achieved with overlapping VLANs.*

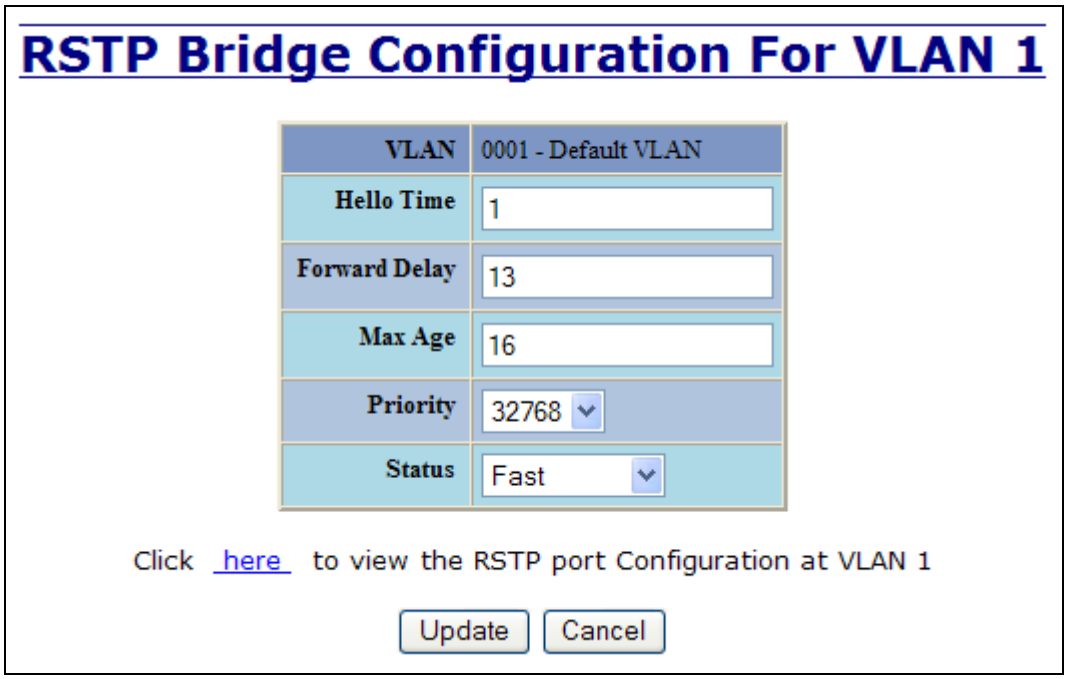
RSTP – Configuration

The Configuration tab under the RSTP category will display the RSTP information for the first VLAN. Using the pull-down menu at the top of the page an administrator can choose which VLAN to configure RSTP on. Once the VLAN is selected, the administrator may configure the bridge by clicking on the 'Configuration' link in the middle of the page.



RSTP – Configuration Continued…

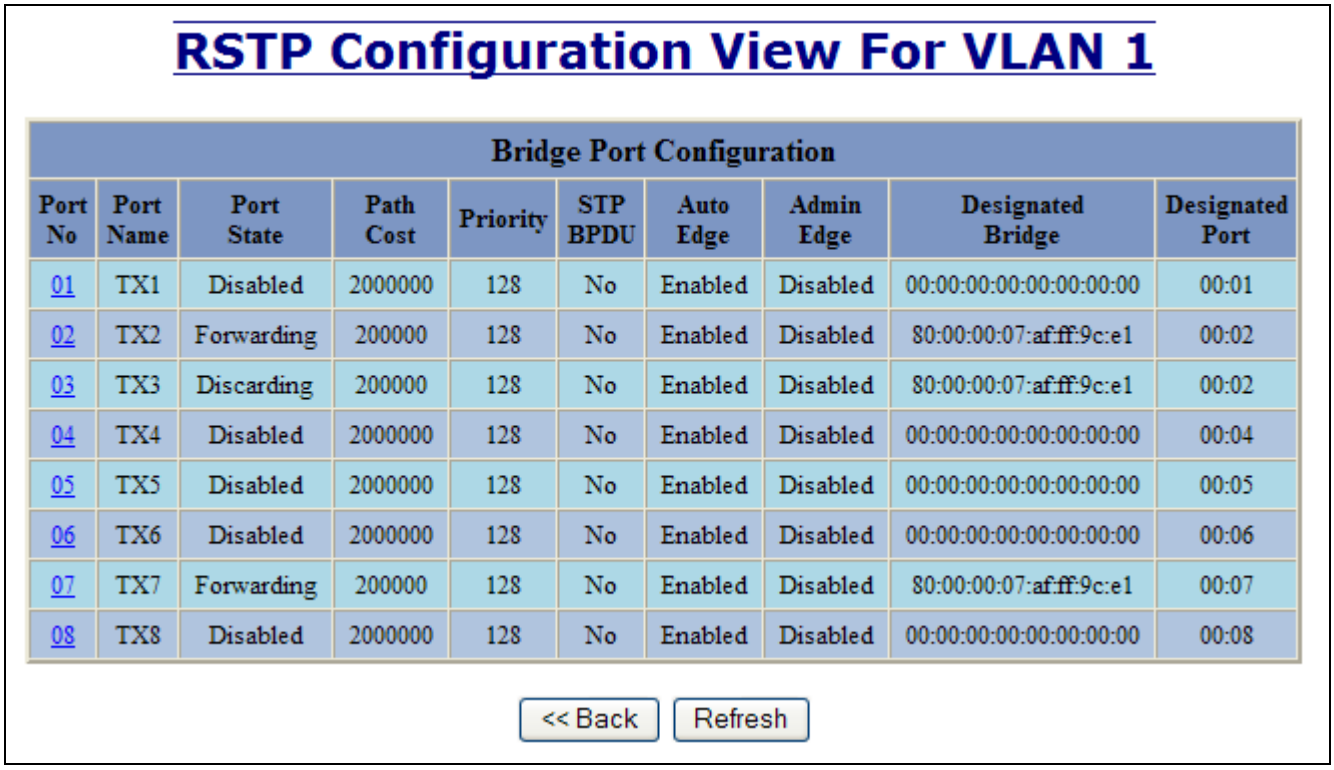
The configuration screen for the VLAN that was previously selected will look like the example below. Here the administrator can make changes such as the Hello Time, Forward Delay, Max Age, Priority, and the Status of RSTP on that VLAN. The administrator or user can see the current RSTP status of the ports on that VLAN by clicking on the 'here' link to view RSTP Port Configuration at VLAN#.



Note: *It is recommended that RSTP rings consist of RSTP capable switches.*
Trunking must be disabled in order to use RSTP.
RSTP on overlapping VLANs is not supported and the system will automatically disable RSTP on the VLAN that has overlapping ports.

RSTP – Configuration Continued…

Following the link for the view RSTP Port Configuration at VLAN#, the administrator or user can see the current RSTP status of the ports on that VLAN. This will show information such as the Path Cost and the Port State. If the switch sees a redundant path it will put the port with the highest Path Cost into Blocking mode where it will discard packets coming in on that port. In the example below, TX3 is a redundant port with port TX2, therefore TX2 is forwarding and TX3 is discarding.

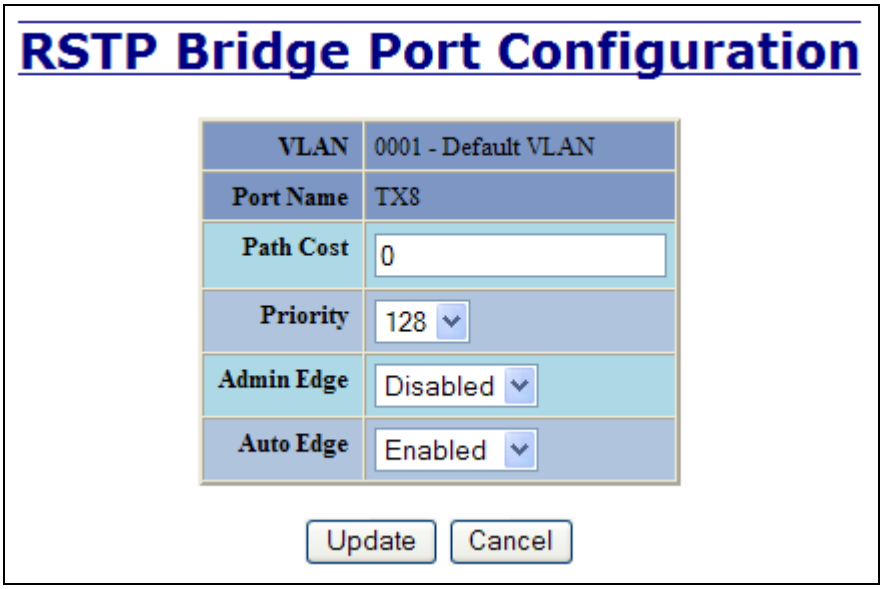


RSTP Configuration View For VLAN 1

Bridge Port Configuration									
Port No	Port Name	Port State	Path Cost	Priority	STP BPDU	Auto Edge	Admin Edge	Designated Bridge	Designated Port
01	TX1	Disabled	2000000	128	No	Enabled	Disabled	00:00:00:00:00:00:00:00	00:01
02	TX2	Forwarding	200000	128	No	Enabled	Disabled	80:00:00:07:af:ff:9c:e1	00:02
03	TX3	Discarding	200000	128	No	Enabled	Disabled	80:00:00:07:af:ff:9c:e1	00:02
04	TX4	Disabled	2000000	128	No	Enabled	Disabled	00:00:00:00:00:00:00:00	00:04
05	TX5	Disabled	2000000	128	No	Enabled	Disabled	00:00:00:00:00:00:00:00	00:05
06	TX6	Disabled	2000000	128	No	Enabled	Disabled	00:00:00:00:00:00:00:00	00:06
07	TX7	Forwarding	200000	128	No	Enabled	Disabled	80:00:00:07:af:ff:9c:e1	00:07
08	TX8	Disabled	2000000	128	No	Enabled	Disabled	00:00:00:00:00:00:00:00	00:08

<< Back | Refresh

If the administrator selects one of the ports on the previous screen, he or she can change the Port's Path Cost, Priority, and the status of Admin Edge and Auto Edge.



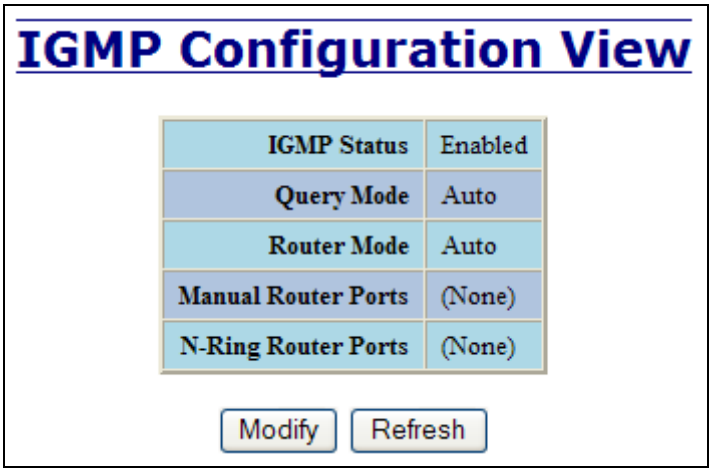
RSTP Bridge Port Configuration

VLAN	0001 - Default VLAN
Port Name	TX8
Path Cost	0
Priority	128
Admin Edge	Disabled
Auto Edge	Enabled

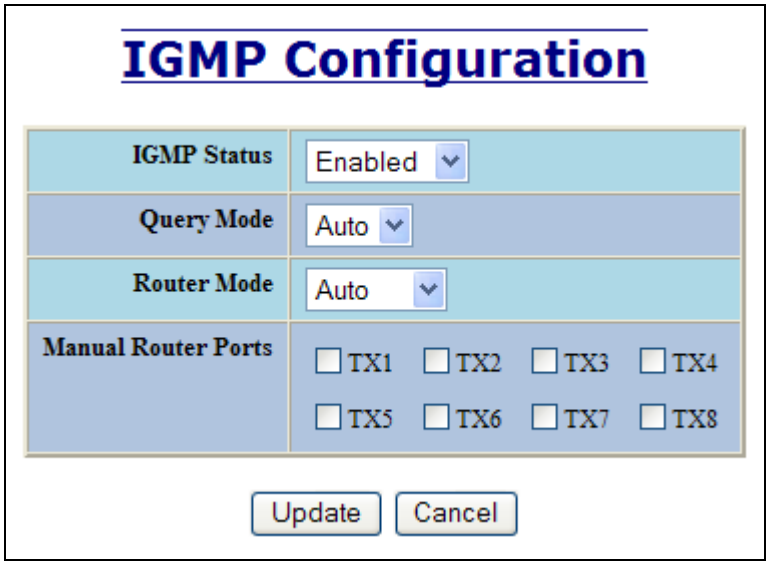
Update | Cancel

IGMP – Configuration

The Configuration tab under the IGMP category will display the IGMP basic configuration settings. By default, IGMP is enabled.

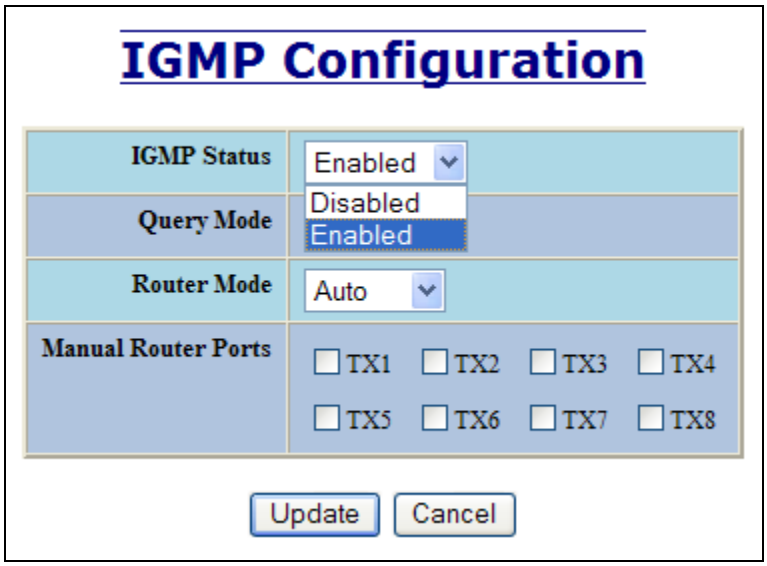


Following the Modify button, the administrator will see a list of configurable fields for the IGMP configuration. Once these fields are filled in to meet the needs of the administrator's network, the changes may be updated by clicking the Update button at the bottom of the page.

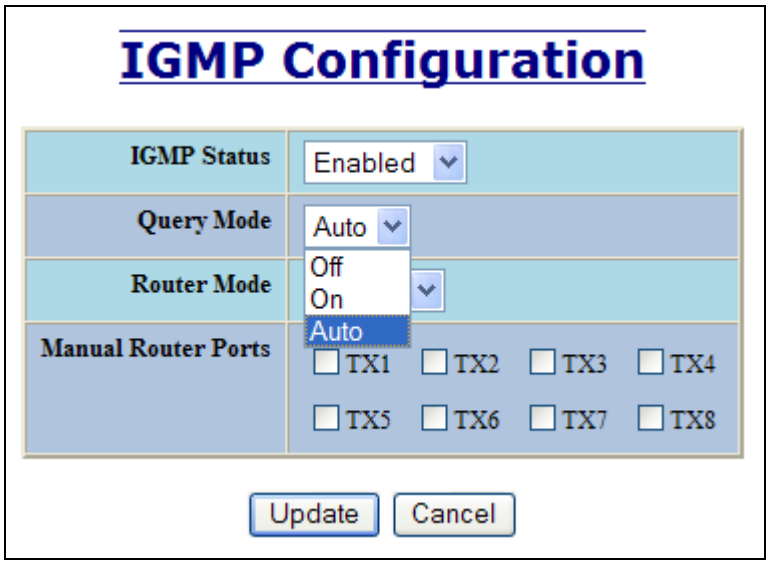


IGMP – Configuration, Continued…

The IGMP Status pull-down allows the user to enable or disable IGMP completely.

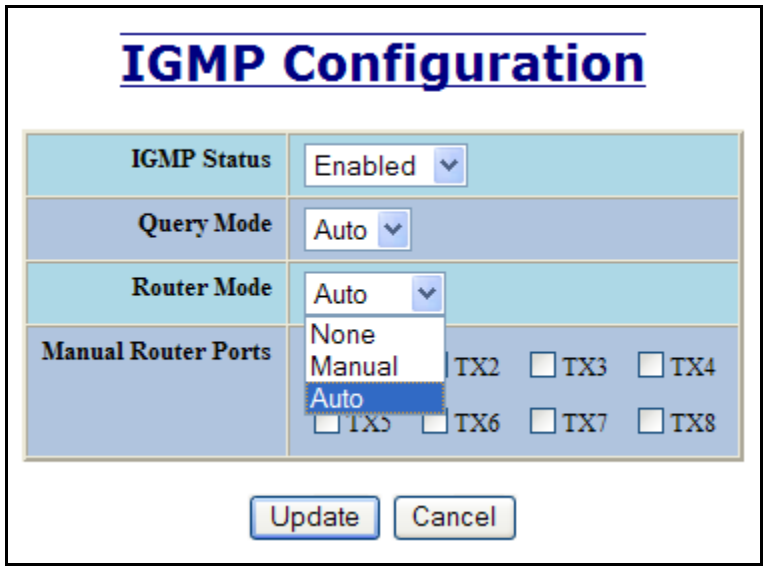


The Query Mode pull-down allows the user to set query mode for Automatic (the default), On (always), or Off (never):

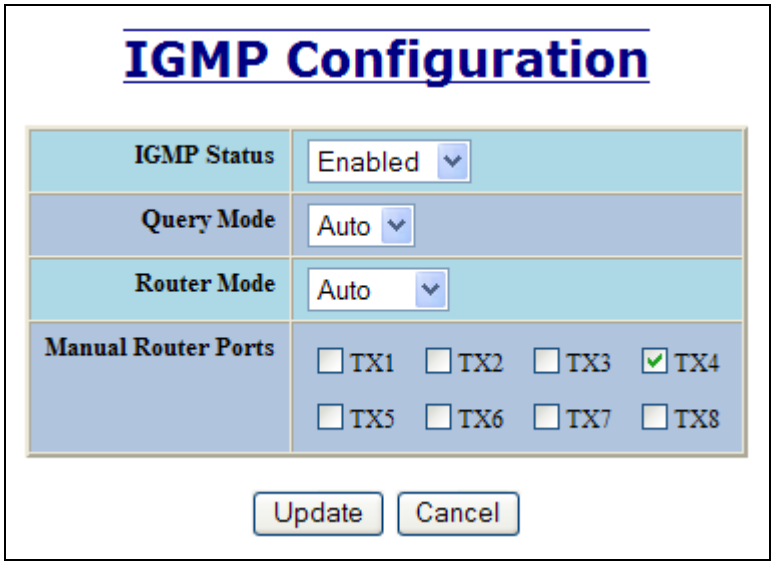


IGMP – Configuration, Continued…

The Router Mode pull-down allows the user to choose router mode. 'Auto' allows for dynamically detected and manually set router ports. 'Manual' allows only for manually set router ports. 'None' allows no router ports.

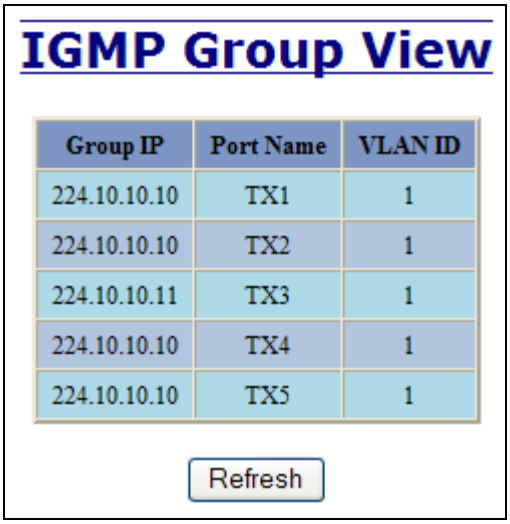


The user can specify the manual router ports:

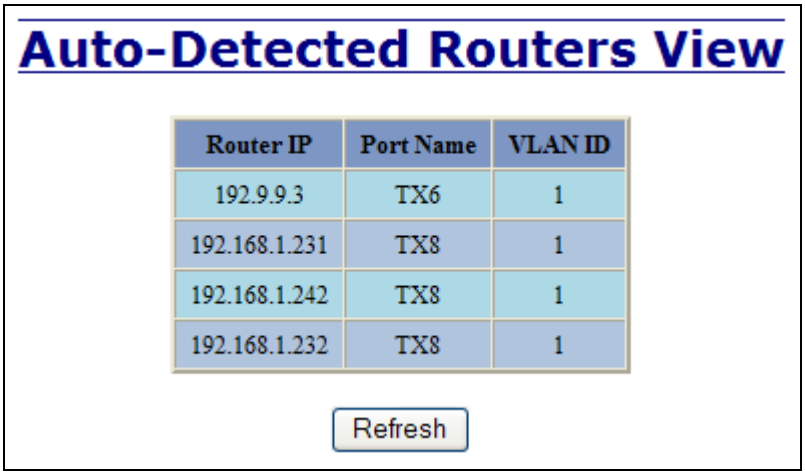


IGMP – Show Group and Show Router

The Show Groups tab under the IGMP category will display a list of IGMP groups based on the Group IP and the port number that it is associated with.



The Show Routers tab under the IGMP category will display a list of Auto-detected Router IPs and the port numbers that they are associated with.



IGMP – RFilter

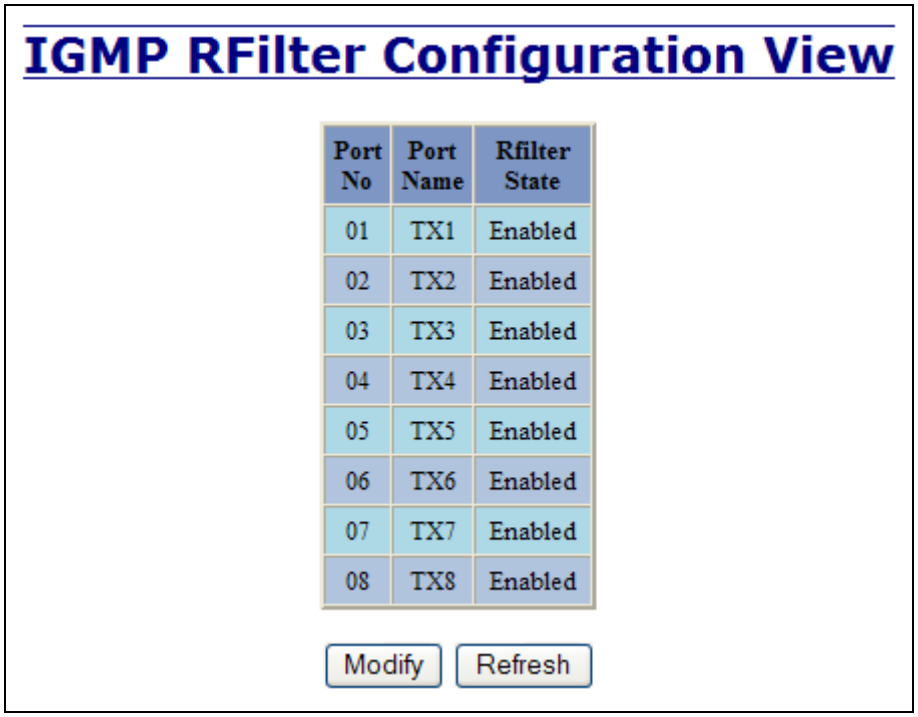
The ‘rfilter’ (**Router Multicast Data Filter**) function allows you to choose whether or not DATA frames with KNOWN group multicast addresses are sent to the ‘router’ ports (links to other switches). Control packets (Join, Leave) will be sent to the router(s) regardless of this setting. “KNOWN” is known from dynamic IGMP Snooping operations.

The factory default is that the Router Multicast Data Filter is enabled for all ports, so any router ports do NOT get DATA frames with KNOWN multicast destination addresses unless a join to a specific multicast address has been received on that port. **Joins override an rfilter.**

If rfilter is disabled, router ports do get DATA frames with KNOWN multicast destination addresses

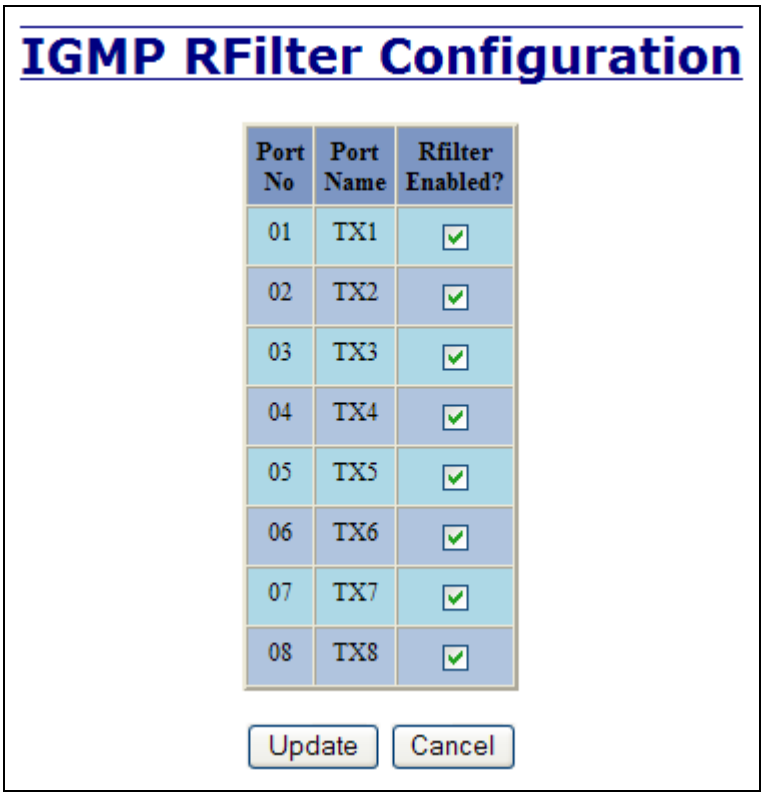
Rfilter can be set for individual ports: any, all, or none. For each port, rfilter will have an impact only if that port is manually or dynamically chosen as a router port.

Default configuration:



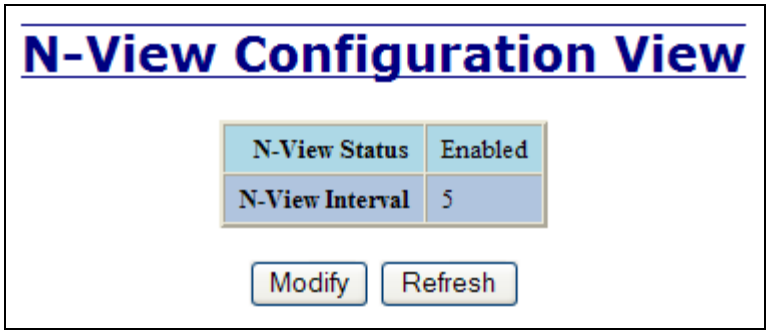
IGMP – RFilter, Continued…

Modifying rfilter port settings:

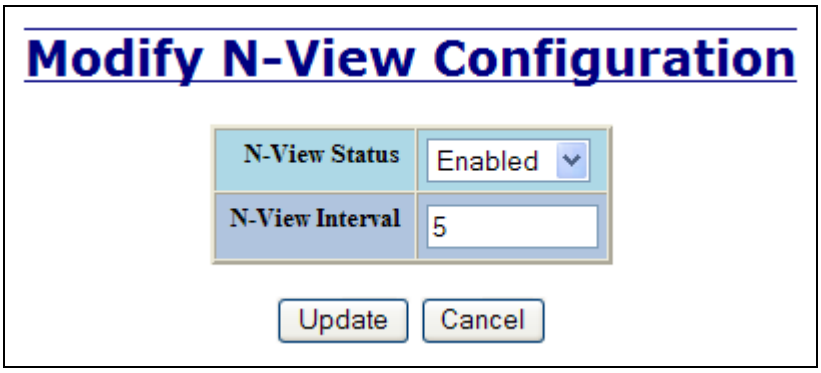


N-View – Configuration

The Configuration tab under the N-View category will display two basic variables for N-View, the status and the interval between packets.

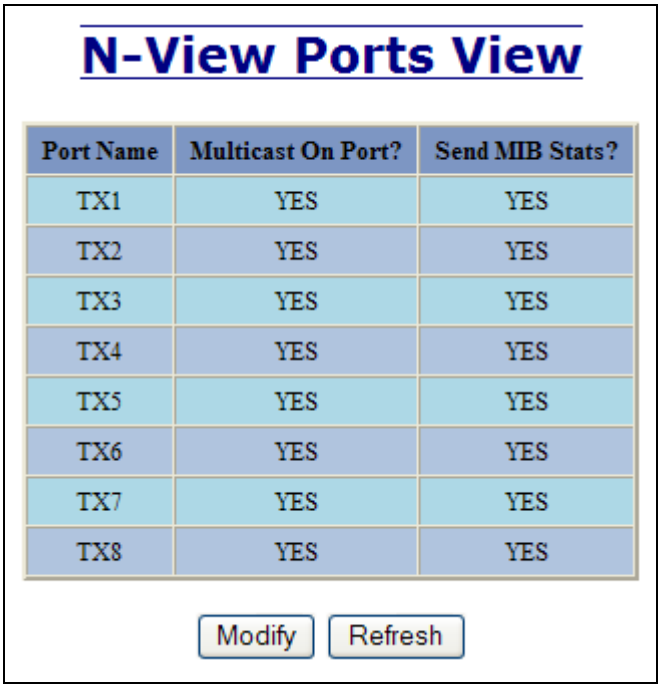


Following the Modify button on the above example, the administrator can modify the variable to change the frequency with which N-View reports information. Increasing the interval will slow the update rate. Decreasing the interval will allow N-View to report more frequently. Additionally, you may Disable or Enable N-View altogether.

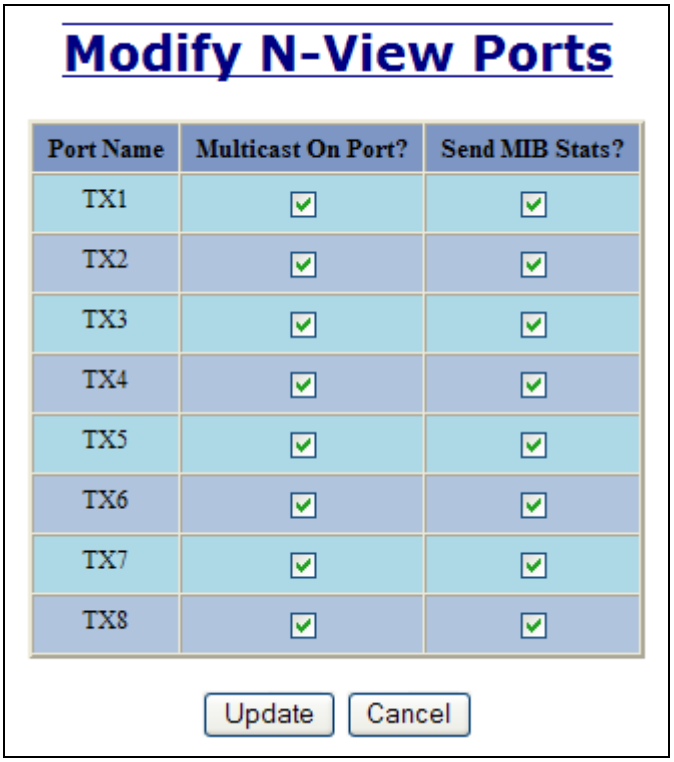


N-View – Ports

The Ports tab under the N-View category will display a list of all the configured ports on the 708 unit along with the ports transmitting multicast packets and MIB stats respectively.

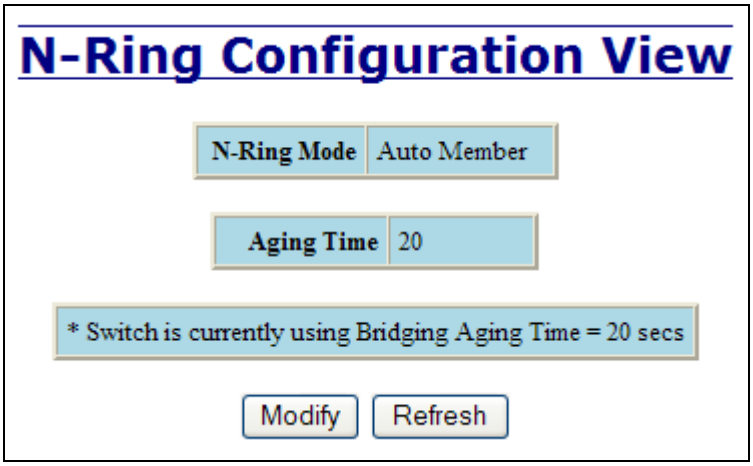


Following the Modify button on the above example, the administrator can modify these two variables to enable or disable multicast out of the port and if MIB stats are sent out for those ports.

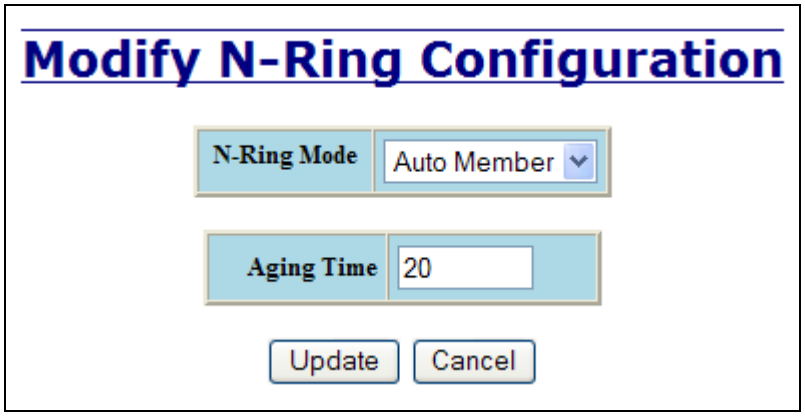


N-Ring – Configuration

The Configuration tab under the N-Ring category will display the N-Ring basic configuration settings. By default, N-Ring is in Auto Member mode and the N-Ring Aging Time is 20 seconds.



Following the Modify button on the above example, the administrator will see a list of configurable fields for the N-Ring configuration, as below.



The N-Ring Aging Time has a default of 20 seconds and is separate from the Bridging Aging Time. N-Ring Aging Time is used when the switch is an N-Ring Manager or becomes an active N-Ring Member, and in either case N-Ring status includes for example:

"Switch is currently using N-Ring Aging Time = 20 Seconds"

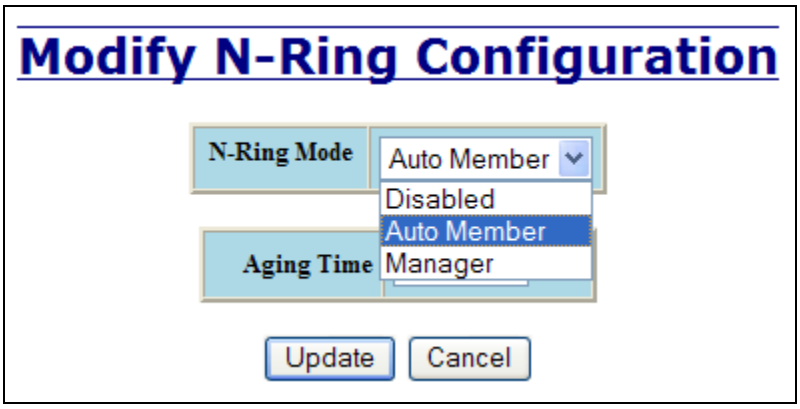
Once these fields are filled in to meet the needs of the administrator's network, the changes may be saved by clicking the Update button at the bottom of the page.

NOTES:

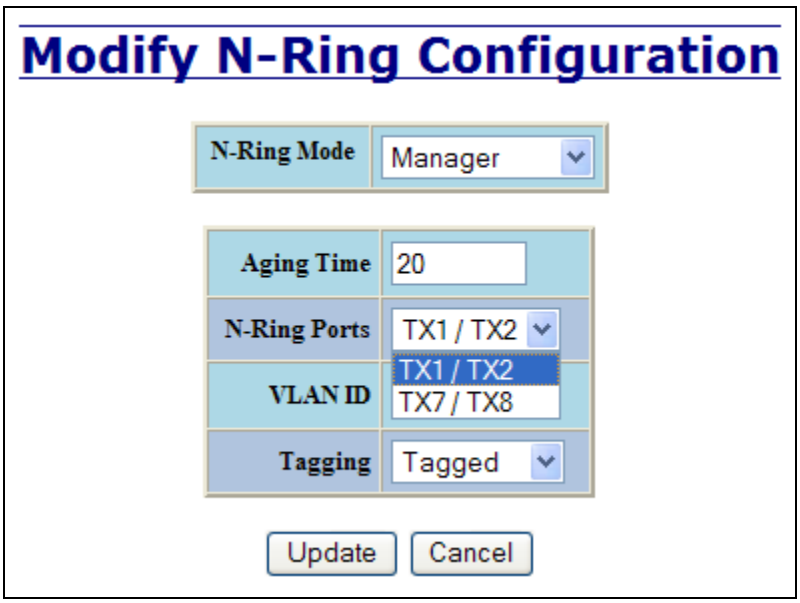
1. ***N-Ring Manager cannot have RSTP or Trunking enabled.***
2. ***RSTP & N-Ring are different modes and cannot share links or segments along those lines. See the examples in the RSTP configuration section.***
3. ***Do not use Trunking on an N-Ring manager. Do not connect the N-Ring to actively Trunking ports on an Auto Member.***
4. ***Any one 708 can only participate in one N-Ring.***
5. ***N-Ring copper ports must be run at 100Mb full duplex, including the default 'autonegotiate' as long as all switches in the ring support 100Mb full duplex.***

N-Ring – Configuration, Continued…

The “N-Ring Mode” is one of three, as below:



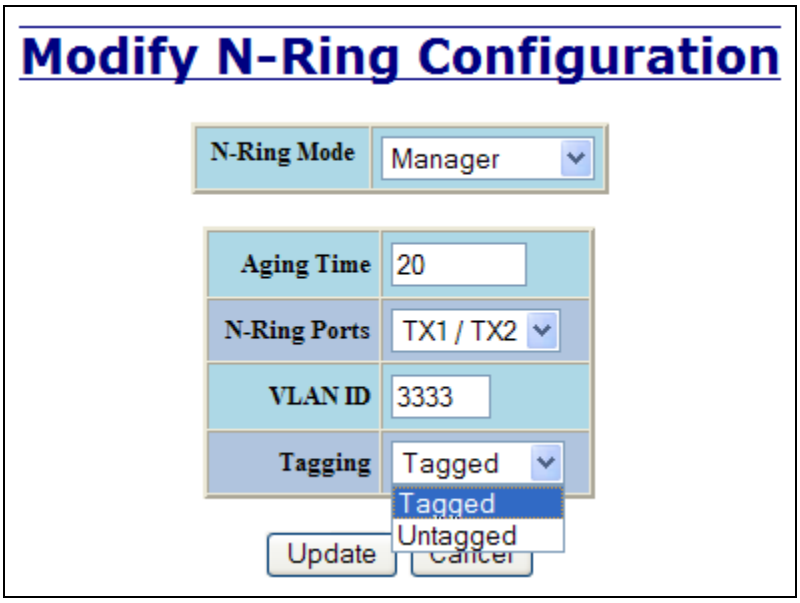
If N-Ring Mode is “Manager”, then a pull-down allows selection as available of ports TX1 and TX2, or TX7 and TX8 (FX1 and FX2 on 708FX2) as N-Ring ports.



N-Ring – Configuration, Continued…

If N-Ring Mode is “Manager”, then VLAN ID can be set to a unique VLAN id (1 ~ 4094). Default is 3333.

If N-Ring Mode is “Manager”, then a pull-down allows selection as to whether the N-Ring ports are members of the VLAN’s Tagged or Untagged ports. Default is Tagged.



Once these fields are filled in to meet the needs of the administrator’s network, the changes may be saved by clicking the Update button at the bottom of the page.

NOTES:

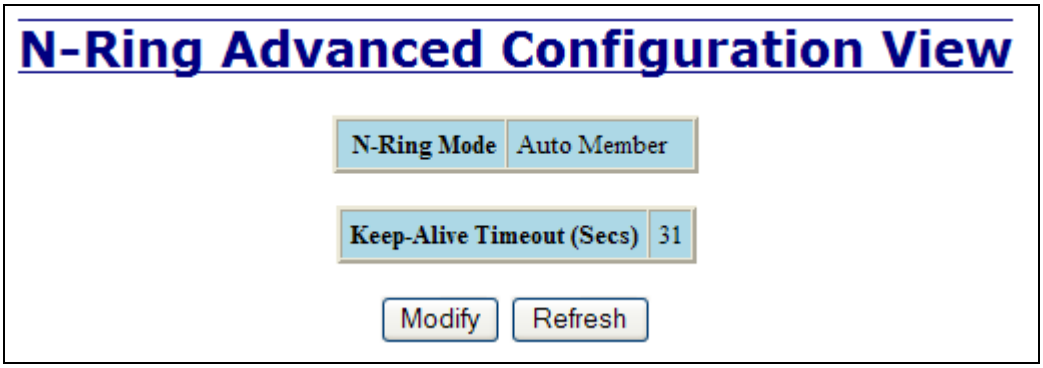
1. ***Since VLANs are implemented for security reasons as well as traffic flow, N-Ring only makes minimal changes. It is up to the administrator to ensure that VLANs are configured correctly on the N-Ring manager and all N-Ring members.***
2. ***When the N-Ring manager and all N-Ring Members are in defaults, changing the N-Ring manager to use a Tagged VLAN requires no user interaction to allow non-ring traffic to pass through the ring. This works because changing to a Tagged VLAN does not remove the ring ports from the default VLAN.***
3. ***When the N-Ring manager and all N-Ring Members are in defaults, changing the N-Ring manager to use an Untagged VLAN other than VID 1, requires the administrator to add non-ring ports to the N-Ring VLAN to allow non-ring traffic to pass through the ring. This occurs because the N-Ring ports must be removed from VID 1 because an untagged port may only be a member of one VLAN.***

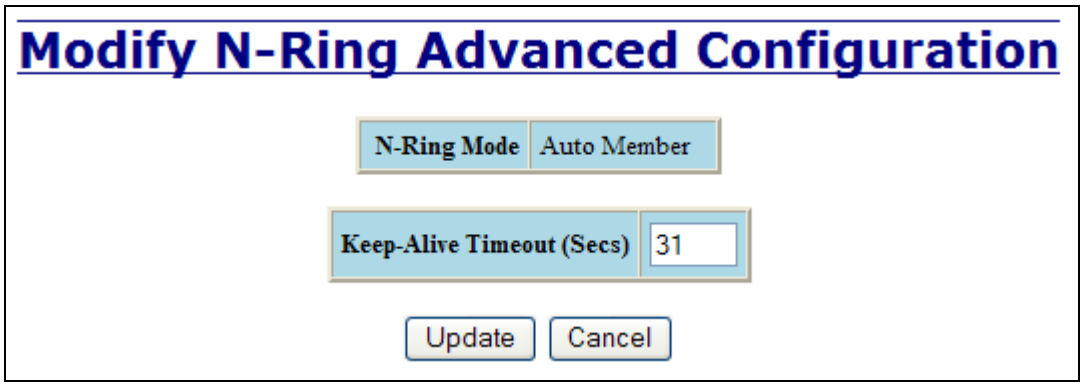
N-Ring – Advanced Configuration

If switch is an N-Ring Member, the following data will be shown:

N-Ring Mode
Current N-Ring mode of switch.

Keep-Alive Timeout:
Keep-Alive timeout is used when switch is active in an N-Ring. The range is **5-1000000** seconds.





If switch is an N-Ring Manager, the following advanced configuration data will be shown:

N-Ring Mode
Current N-Ring mode of switch.

Self Health Packet Interval:
The amount of time to wait in milliseconds before sending Self-Health packets. The default is 10.

Maximum Missed Packets
The number of missed Self-Health packets that constitute a fault. The default is 2.

Sign-On Delay
The amount of time to wait in milliseconds before requesting initial sign-on information from ring members. The default is 1000.

Sign-On Match Packets
The number of times the switch count must match before starting the sign-on process. The default is 3.

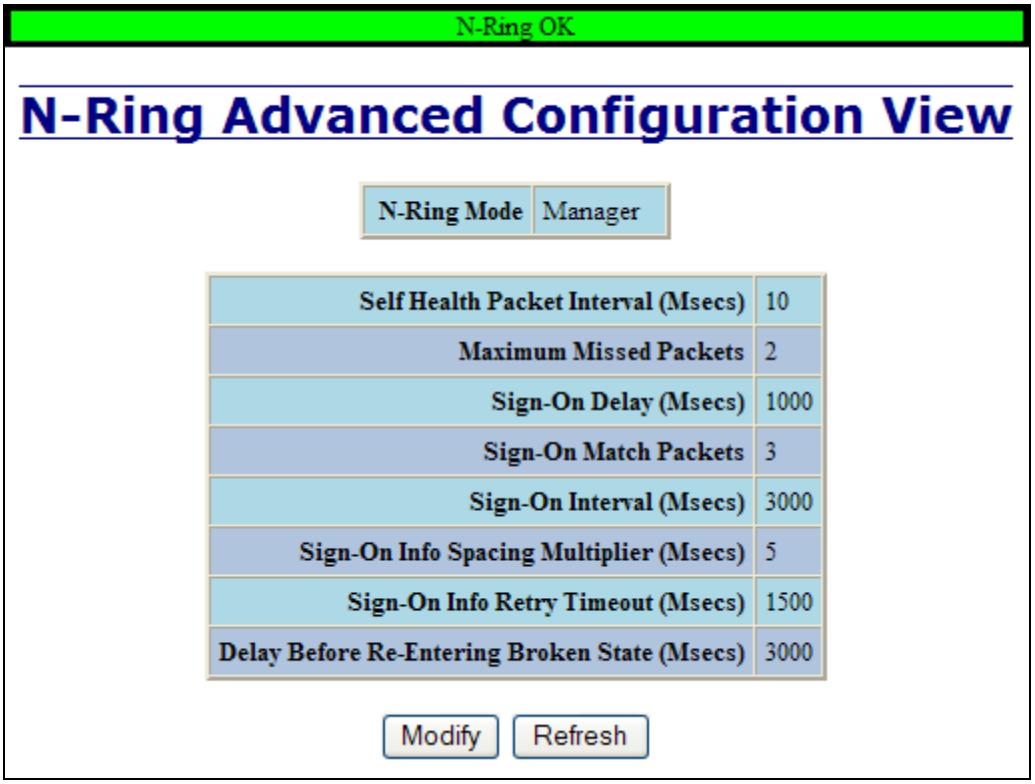
Sign-On Interval
The interval of time to wait in milliseconds before requesting subsequent sign-on information from ring members when the ring is broken. The default is 3000.

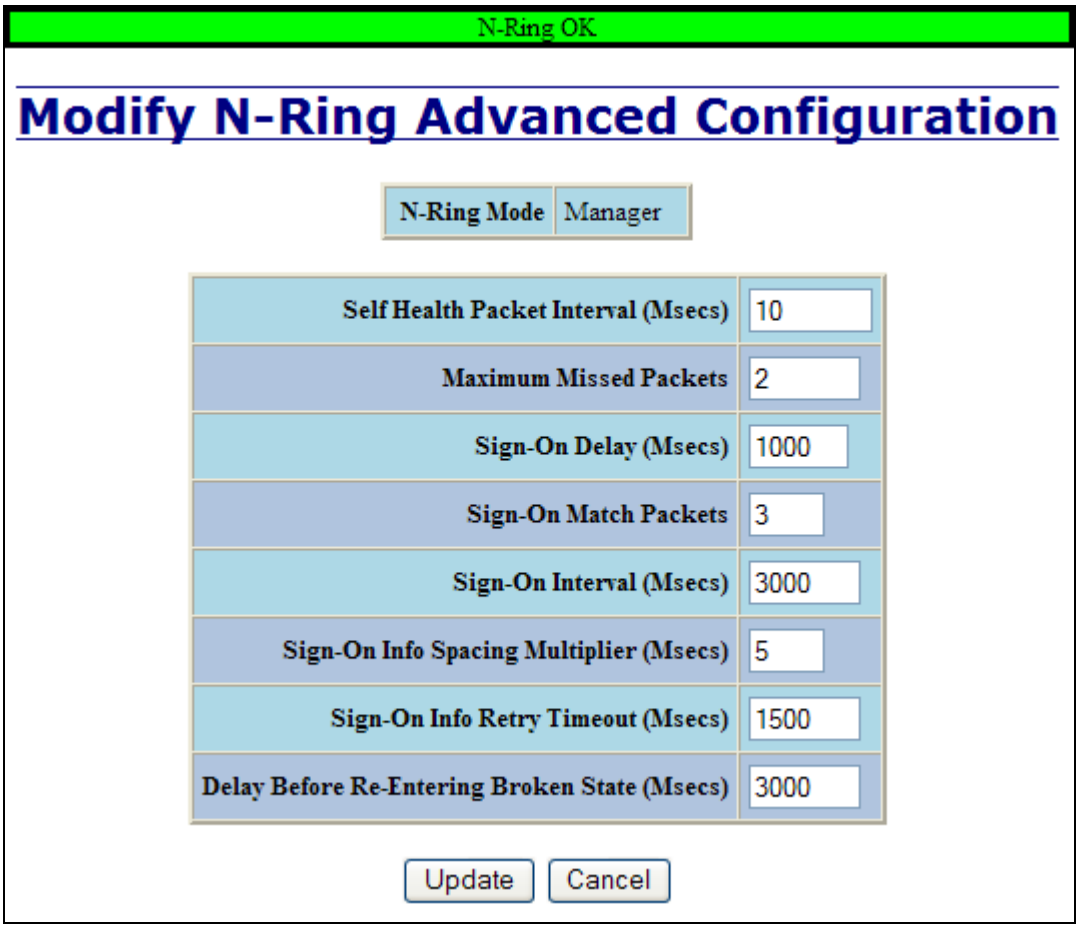
Sign-On Info Spacing Multiplier
The amount of time to wait in milliseconds, scaled by switch number, before sending information to the ring manager. The default is 5.

Sign-On Info Retry Timeout
The amount of time the ring member will wait in milliseconds for the ring manager to acknowledge receipt of the member's information before the member tries to re-send the information. The default is 1500.

Delay Before Re-Entering Broken State
The amount of time, in milliseconds, that must elapse before the ring is allowed to go back into the broken state. The default is 3000.

N-Ring – Advanced Configuration, Continued…

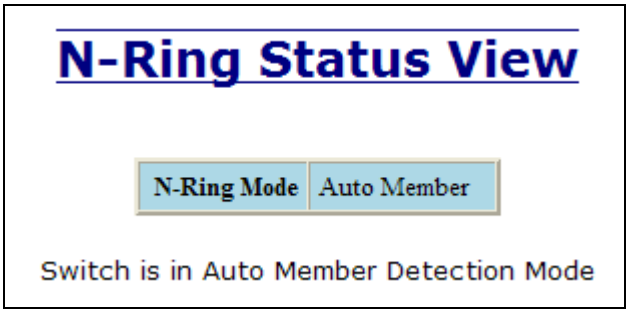




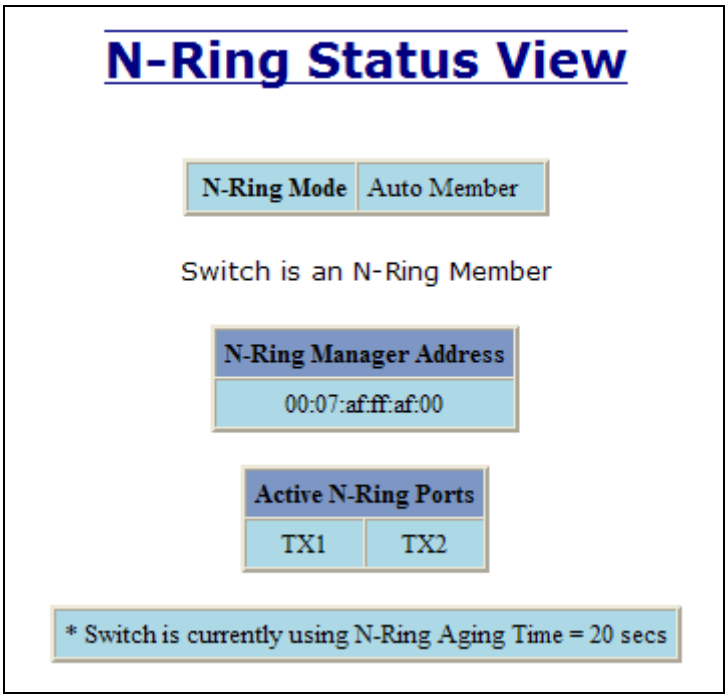
N-Ring – Status

The Status tab under the N-Ring category will display the N-Ring status.

Below is an example of N-Ring Status from a switch in defaults (N-Ring Auto Member) that is not an N-Ring Manager and has not become an “Active” N-Ring Member:



Below is an example of N-Ring Status from an “Active” N-Ring Member:



N-Ring – Status, Continued…

Below is an example of N-Ring Status from an N-Ring Manager with a healthy N-Ring:

N-Ring OK

N-Ring Status View

Switch is an N-Ring Manager, using N-Ring Aging Time = 20 Seconds

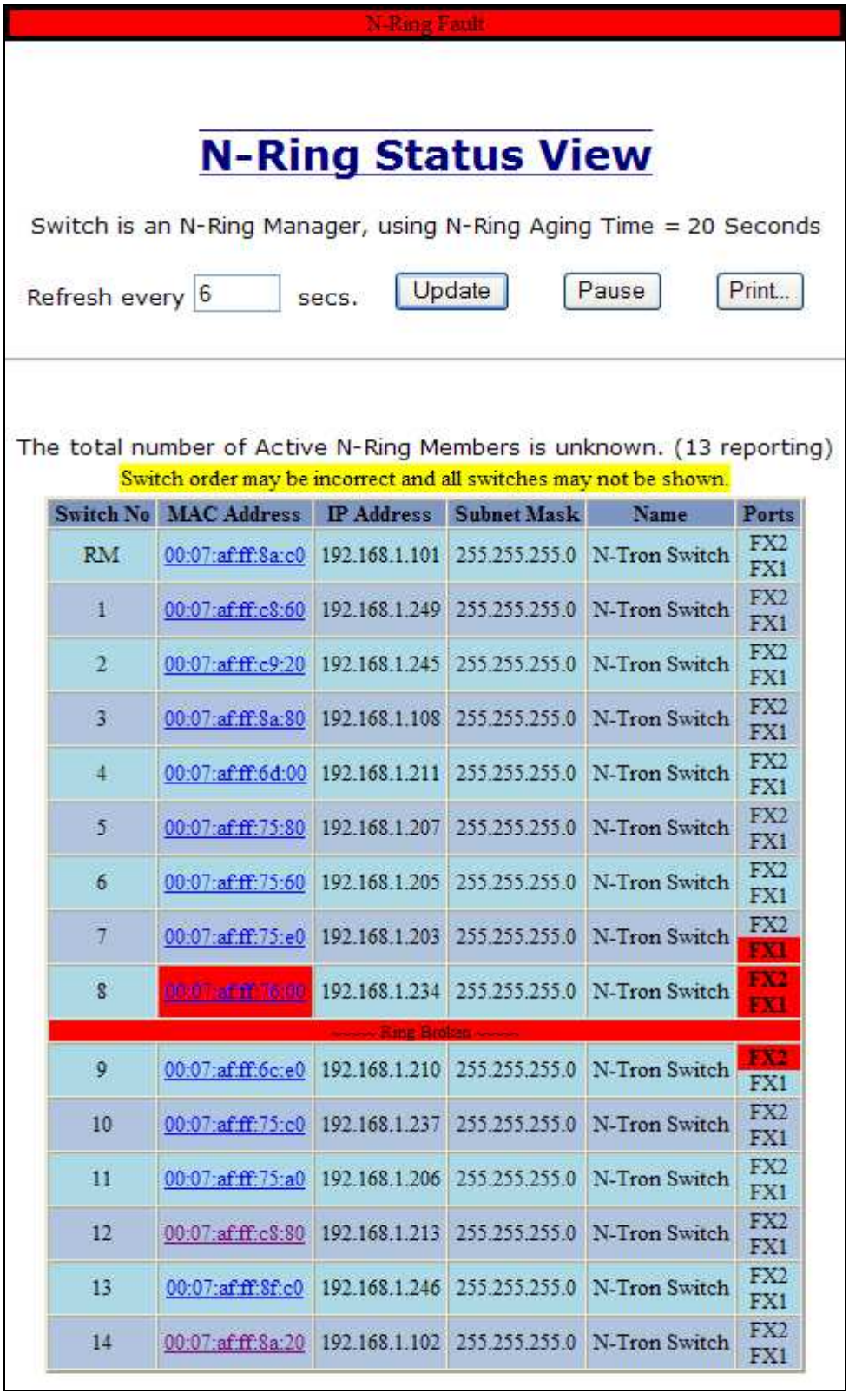
Refresh every 6 secs. Update Pause Print...

14 Active Members Detected In Current N-Ring (14 reporting)

Switch No	MAC Address	IP Address	Subnet Mask	Name	Ports
RM	00:07:af:ff:8a:80	192.168.1.108	255.255.255.0	N-Tron Switch	TX2 TX1
1	00:07:af:ff:c9:20	192.168.1.245	255.255.255.0	N-Tron Switch	TX2 TX1
2	00:07:af:ff:c8:80	192.168.1.226	255.255.255.0	N-Tron Switch	TX2 TX1
3	00:07:af:ff:8a:60	192.168.1.104	255.255.255.0	N-Tron Switch	TX2 TX1
4	00:07:af:ff:b8:00	192.168.1.225	255.255.255.0	N-Tron Switch	TX2 TX1
5	00:07:af:ff:8a:c0	192.168.1.101	255.255.255.0	N-Tron Switch	TX2 TX1
6	00:07:af:ff:af:20	192.168.1.235	255.255.255.0	N-Tron Switch	TX2 TX1
7	00:07:af:ff:8a:e0	192.168.1.100	255.255.255.0	N-Tron Switch	TX2 TX1
8	00:07:af:ff:8a:00	192.168.1.105	255.255.255.0	N-Tron Switch	TX2 TX1
9	00:07:af:ff:8f:e0	192.168.1.239	255.255.255.0	N-Tron Switch	TX2 TX1
10	00:07:af:ff:8c:00	192.168.1.126	255.255.255.0	N-Tron Switch	TX2 TX1
11	00:07:af:ff:8a:20	192.168.1.102	255.255.255.0	N-Tron Switch	TX2 TX1
12	00:07:af:ff:c8:60	192.168.1.249	255.255.255.0	N-Tron Switch	TX2 TX1
13	00:07:af:ff:8b:00	192.168.1.110	255.255.255.0	N-Tron Switch	TX2 TX1
14	00:07:af:ff:8e:60	192.168.1.127	255.255.255.0	N-Tron Switch	TX2 TX1

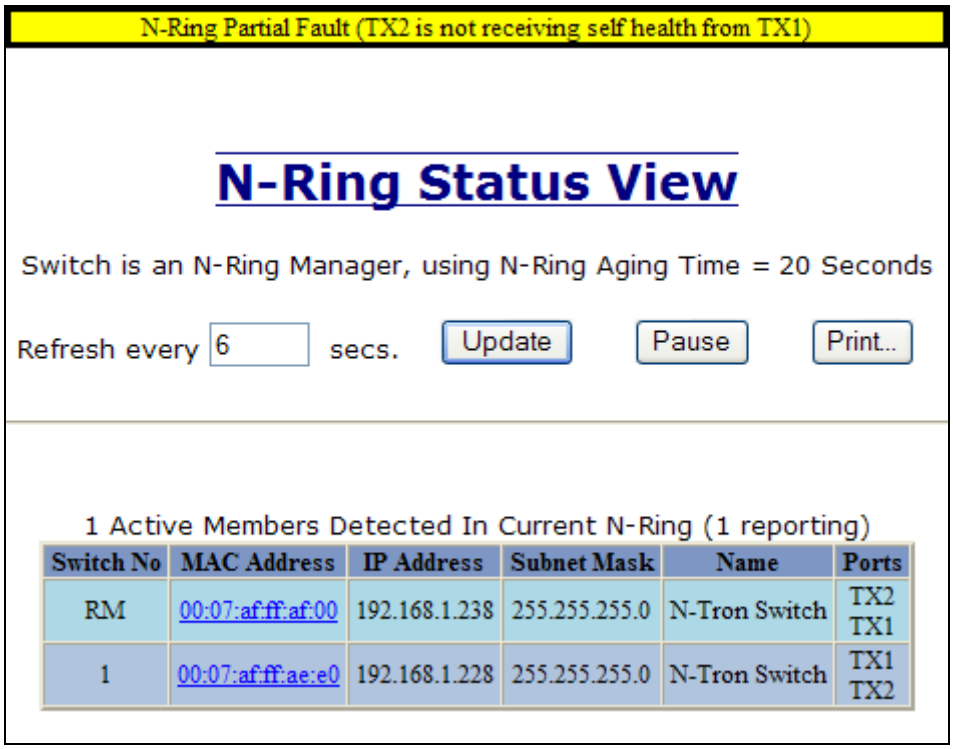
N-Ring – Status, Continued…

Below is an example of N-Ring Status from an N-Ring Manager with a faulted N-Ring. The red fields on the N-Ring Map show problems. Ports that are red indicate that the port is not linked. MAC addresses that are red indicate that there is no communication to that switch. The red "Ring Broken" line shows where the N-Ring is broken.

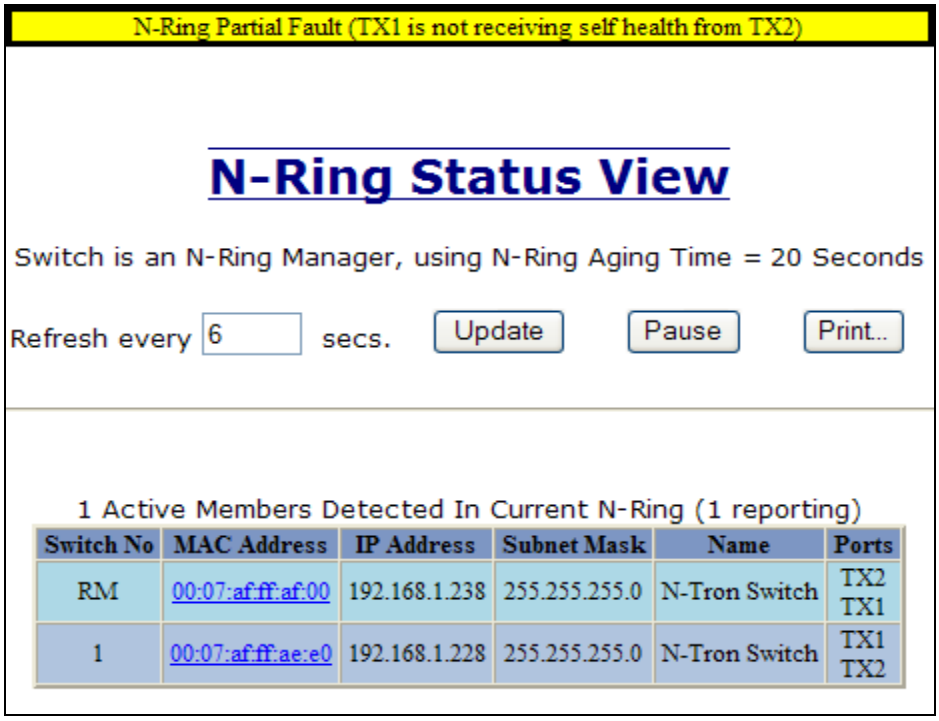


N-Ring – Status, Continued…

In rare cases an N-Ring can have a “Partial Fault”. An example of this is to have a break in just one fiber in a duplex channel fiber pair. The screenshot below shows N-Ring Manager Status when a ‘Higher’ N-Ring Port (TX2, TX8/FX2) is not receiving self health frames all the way around the N-Ring, though the other (low TX1, TX7/FX1) N-Ring port is:

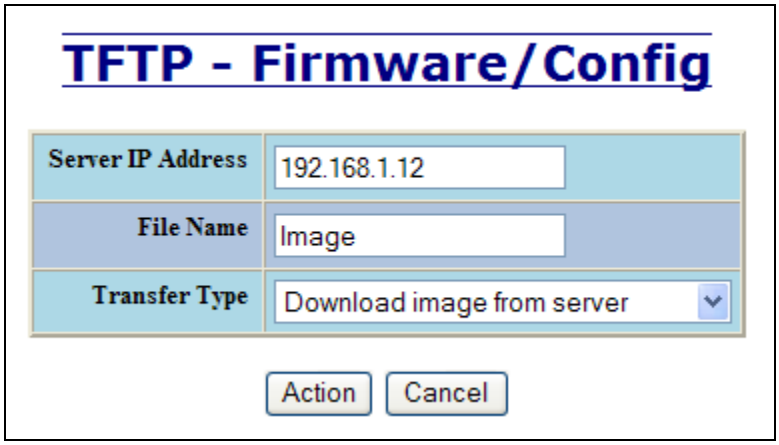

N-Ring Partial Fault (TX2 is not receiving self health from TX1)
N-Ring Status View
Switch is an N-Ring Manager, using N-Ring Aging Time = 20 Seconds
Refresh every 6 secs.
Update
Pause
Print...
1 Active Members Detected In Current N-Ring (1 reporting)
Switch No | MAC Address | IP Address | Subnet Mask | Name | Ports
RM | 00:07:af:ff:af:00 | 192.168.1.238 | 255.255.255.0 | N-Tron Switch | TX2 TX1
1 | 00:07:af:ff:ae:e0 | 192.168.1.228 | 255.255.255.0 | N-Tron Switch | TX1 TX2

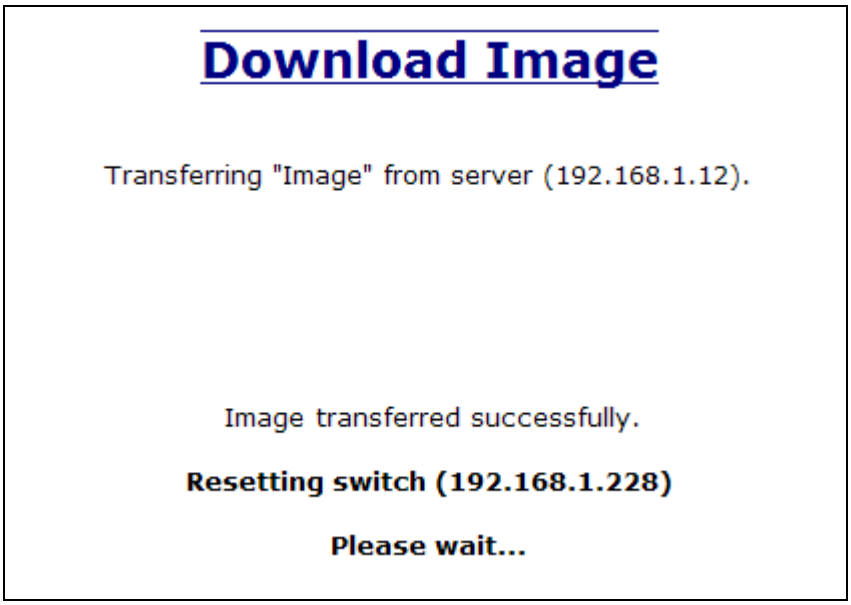
The screenshot below shows N-Ring Manager Status when a ‘Lower’ N-Ring Port (TX1 or TX7/FX1) is not receiving self health frames all the way around the N-Ring, though the other (high TX2 of TX8/FX2) N-Ring port is:


N-Ring Partial Fault (TX1 is not receiving self health from TX2)
N-Ring Status View
Switch is an N-Ring Manager, using N-Ring Aging Time = 20 Seconds
Refresh every 6 secs.
Update
Pause
Print...
1 Active Members Detected In Current N-Ring (1 reporting)
Switch No | MAC Address | IP Address | Subnet Mask | Name | Ports
RM | 00:07:af:ff:af:00 | 192.168.1.238 | 255.255.255.0 | N-Tron Switch | TX2 TX1
1 | 00:07:af:ff:ae:e0 | 192.168.1.228 | 255.255.255.0 | N-Tron Switch | TX1 TX2

Firmware/Config – TFTP

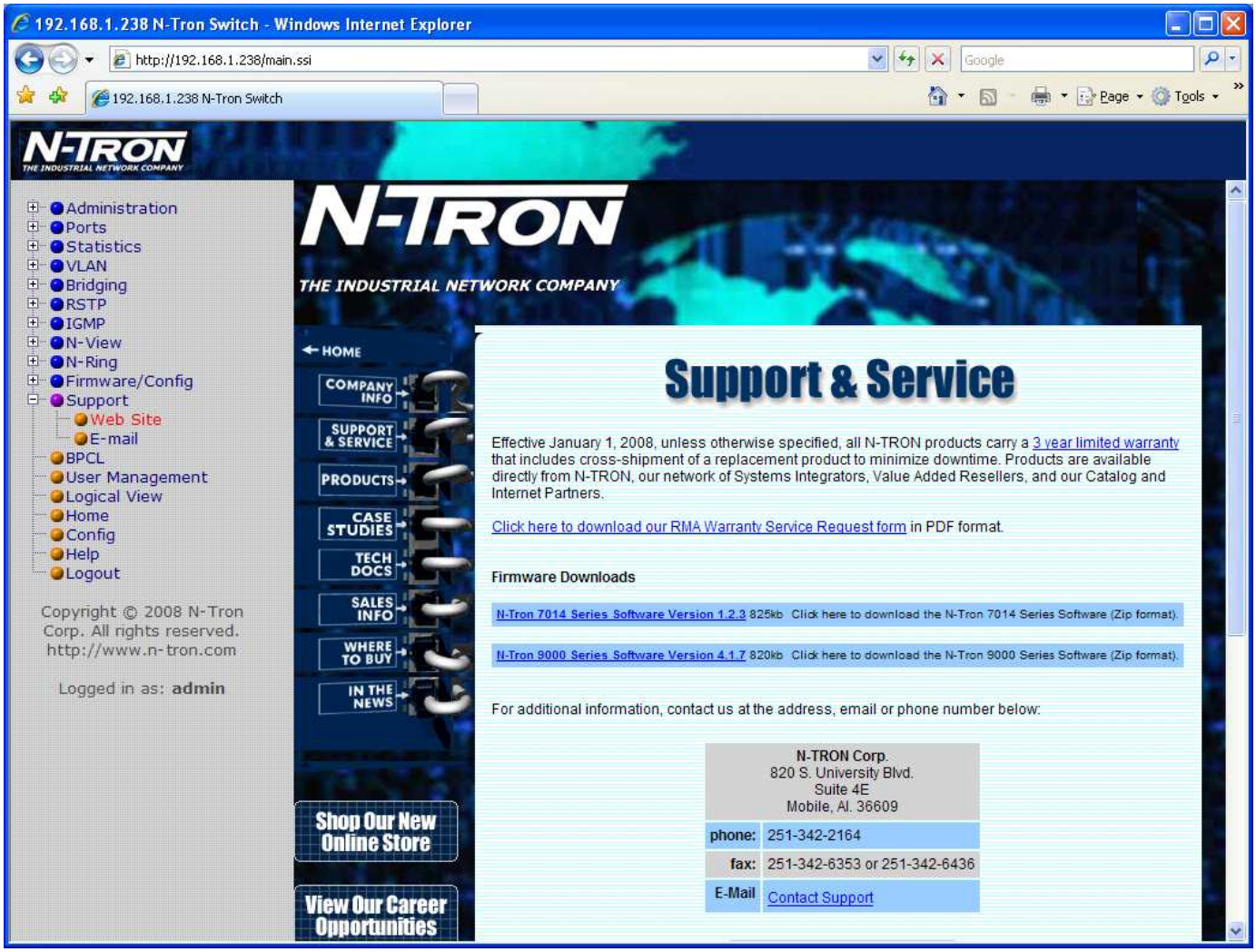
The TFTP tab under the Firmware/Config category gives the administrator the ability to upload or download a config file for a 708 Series switch. This allows administrators to backup their configurations to a server offsite in case they need to reload their custom configurations at a later time. Administrators are also given the ability to flash the switch allowing them to update the firmware in the field without losing their current configurations and without having to send the unit back to N-Tron for updates in the future. It is important not to cycle power on the switch or interrupt the data connection between the TFTP server and the switch while you are flashing or uploading/downloading a config file. The switch will not stop working if this does occur, but the administrator will have to retransfer the file.





Support – Web Site and E-mail

If at any point in time you get confused or would like additional support directly from N-Tron, you may visit N-Tron's web site, or e-mail N-Tron directly with the links provided for more information.


192.168.1.238 N-Tron Switch - Windows Internet Explorer
http://192.168.1.238/main.ssi
192.168.1.238 N-Tron Switch
N-TRON
THE INDUSTRIAL NETWORK COMPANY
Administration
Ports
Statistics
VLAN
Bridging
RSTP
IGMP
N-View
N-Ring
Firmware/Config
Support
Web Site
E-mail
BPCL
User Management
Logical View
Home
Config
Help
Logout
Copyright © 2008 N-Tron Corp. All rights reserved. http://www.n-tron.com
Logged in as: admin
HOME
COMPANY INFO
SUPPORT & SERVICE
PRODUCTS
CASE STUDIES
TECH DOCS
SALES INFO
WHERE TO BUY
IN THE NEWS
Shop Our New Online Store
View Our Career Opportunities
Support & Service
Effective January 1, 2008, unless otherwise specified, all N-TRON products carry a 3 year limited warranty that includes cross-shipment of a replacement product to minimize downtime. Products are available directly from N-TRON, our network of Systems Integrators, Value Added Resellers, and our Catalog and Internet Partners.
Click here to download our RMA Warranty Service Request form in PDF format.
Firmware Downloads
N-Tron 7014 Series Software Version 1.2.3 825kb Click here to download the N-Tron 7014 Series Software (Zip format).
N-Tron 9000 Series Software Version 4.1.7 820kb Click here to download the N-Tron 9000 Series Software (Zip format).
For additional information, contact us at the address, email or phone number below:
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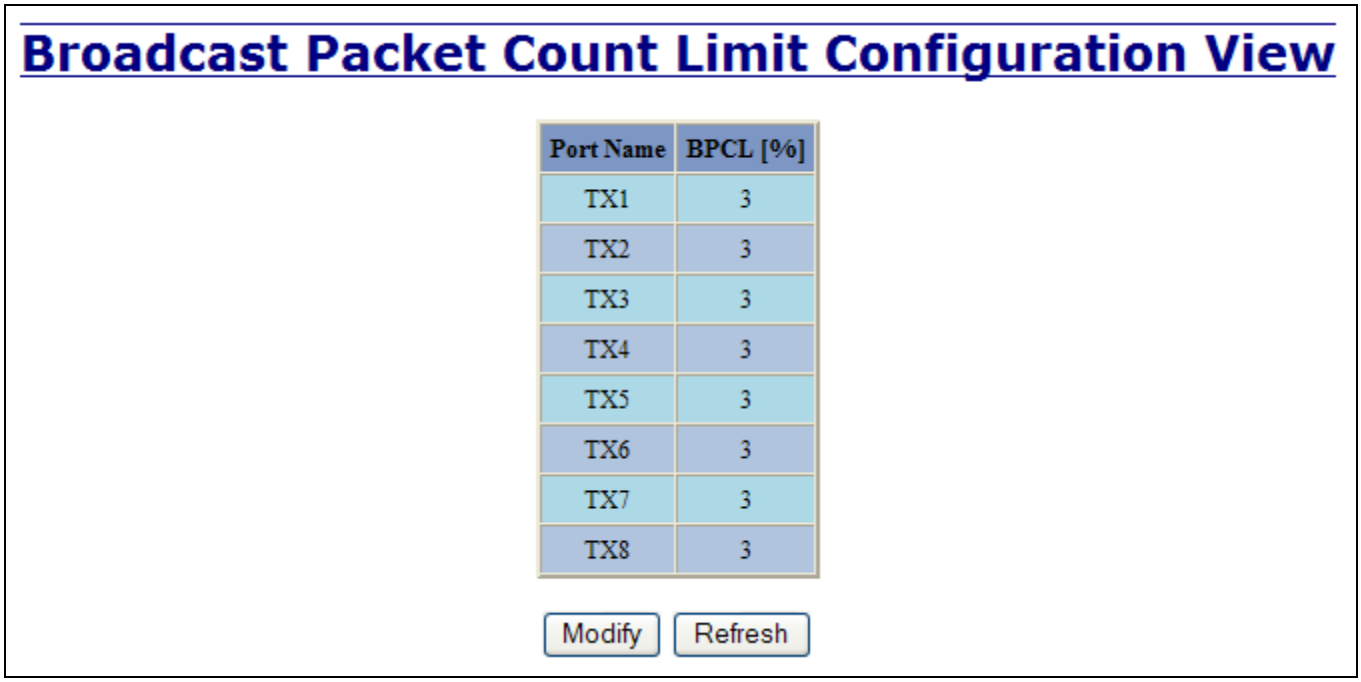
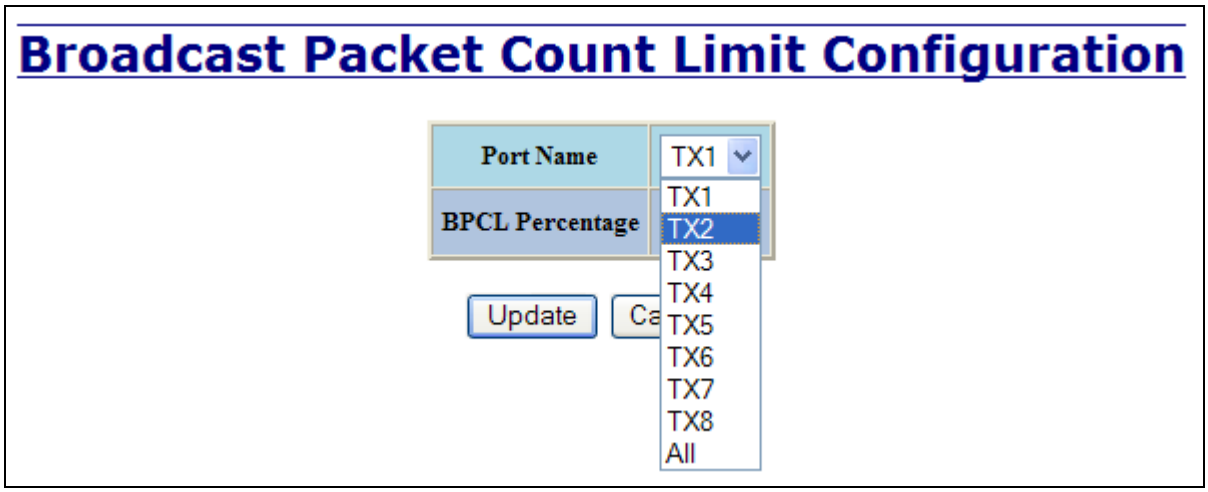
820 S. University Blvd.
Suite 4E
Mobile, Al. 36609
phone: 251-342-2164
fax: 251-342-6353 or 251-342-6436
E-Mail Contact Support

BPCL – Broadcast Packet Count Limit Configuration

The BPCL link will display all the ports that are installed in the 708 Series unit and will list the BPCL Percentage for each port. BPCL defaults to 3%. A Modify button is provided to change these fields.



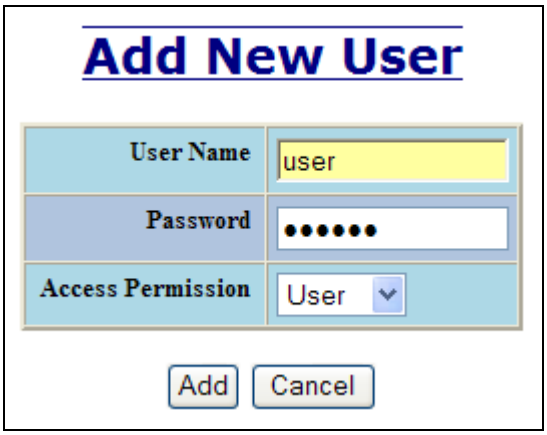
Following the Modify button on the above example, the administrator can modify the BPCL Percentage for each and every port.



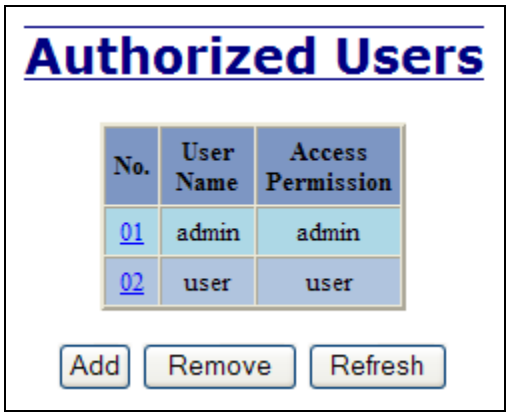
User Management – Adding Users

The User Management link will display a list of all the users who have access to the management features of the switch and their access permissions.

Following the Add button on the above example, the administrator can add another user and assign the user a username, a password, and the user's permissions (user/administrator).

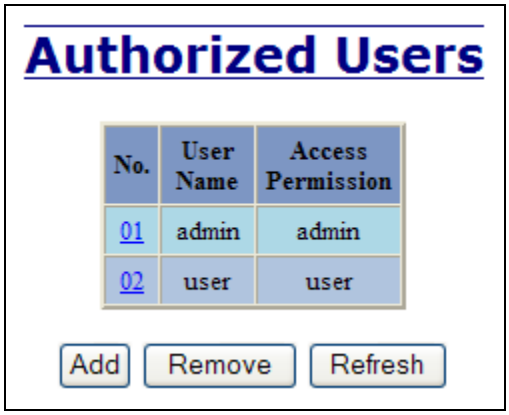


A page should display after the administrator clicks the Add button indicating that the user was successfully added.

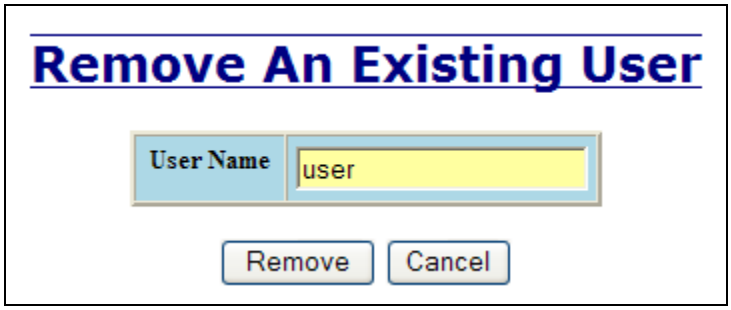


User Management – Removing Users

In order to remove a user, simply click on the Remove button at the bottom of the page.



Following the Remove button on the above example, the administrator can remove a user by entering in the user's name and clicking the Remove button.



A page should follow indicating that the user was successfully removed from the list.

Note: *There are a maximum number of 5 users per switch. User permissions have the right to view switch configurations and to view current port settings, but cannot make any changes to these settings. Admin permissions have the right to change and view any switch configuration and to change and view any current port settings.*

LogicalView

The 708 Web Management offers a logical view of the switch. Here a user or administrator can see a graphical depiction of the 708 switch. Ports that are linked will appear in green, while ports that are not linked will appear in black. The example below shows port 1 linked. The other ports are currently in the down state (not being used).

Configuration – Save or Reset

The Configuration section of web management gives an administrator the ability to save a running configuration into the NVRAM. This step is needed in order for the switch to remember any changes after a power cycle.

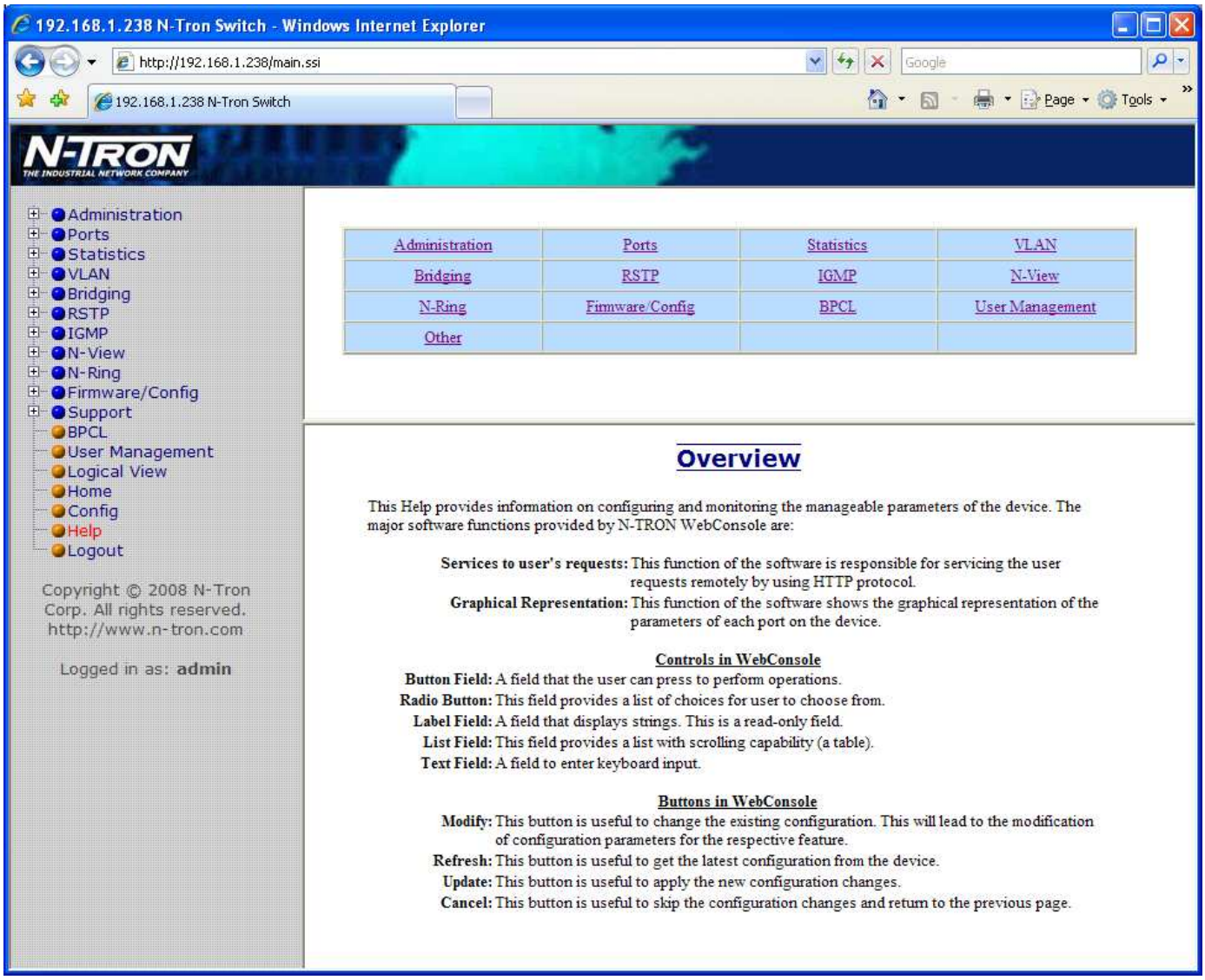
The “Save” button will save all current changes to the configuration for use after the next power cycle. **Note: The current configuration will also be saved to the dongle when connected.**

The “Reset” button will discard all unsaved changes, reset the switch and load the most recently saved configuration settings. **Note: Upon restart, if a configured dongle is connected, the switch will load the configured settings from it and save them into NVRAM.**

The “Factory” button will reload N-Tron’s factory default configuration settings. Doing so will reconfigure the 700 Series switch to factory defaults. In many cases it is desirable to restore factory defaults but retain the IP address, subnet mask, and gateway address settings as well as user names and passwords. Checkboxes are provided to select the desired behavior. **Note: The factory default configuration settings will also be saved to the dongle when connected.**

Configuration Save Or Reset
Dongle is not connected.
Click "Save" button to save changes to the configuration.
Save
Click "Reset" button to reset the switch and load the most recently saved configuration.
Reset
Click "Factory" button to reset switch to factory defaults.
Keep current IP address, subnet mask, and gateway.
Keep current user names and passwords.
Factory

Help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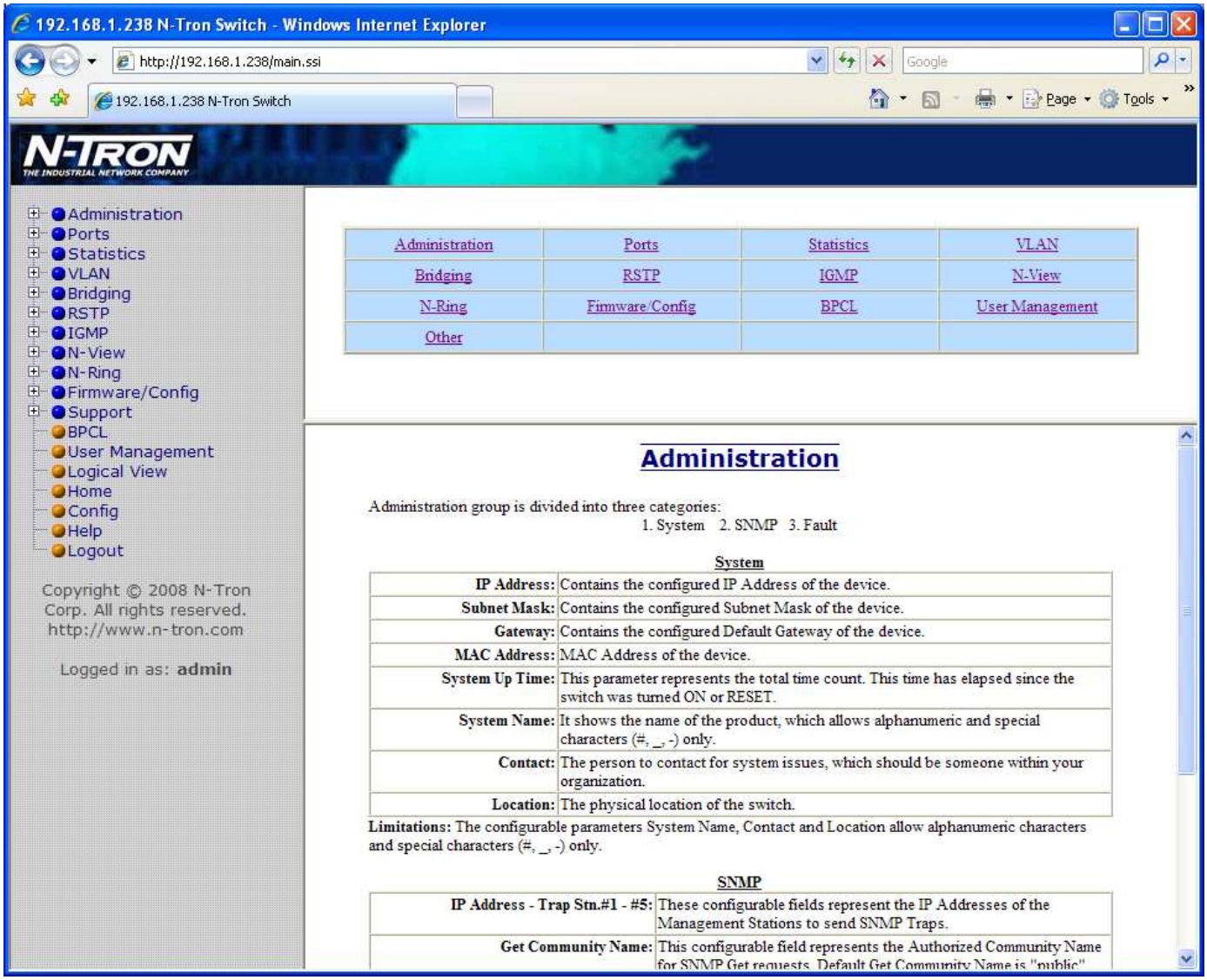
Overview
This Help provides information on configuring and monitoring the manageable parameters of the device. The major software functions provided by N-TRON WebConsole are:
Services to user's requests: This function of the software is responsible for servicing the user requests remotely by using HTTP protocol.
Graphical Representation: This function of the software shows the graphical representation of the parameters of each port on the device.
Controls in WebConsole
Button Field: A field that the user can press to perform operations.
Radio Button: This field provides a list of choices for user to choose from.
Label Field: A field that displays strings. This is a read-only field.
List Field: This field provides a list with scrolling capability (a table).
Text Field: A field to enter keyboard input.
Buttons in WebConsole
Modify: This button is useful to change the existing configuration. This will lead to the modification of configuration parameters for the respective feature.
Refresh: This button is useful to get the latest configuration from the device.
Update: This button is useful to apply the new configuration changes.
Cancel: This button is useful to skip the configuration changes and return to the previous page.

When the Help link is clicked on, you will see the Overview page that will have some basic definitions and more specific choices at the top of the screen. Although this page is not as detailed as the manual, it gives you a basic feel for different features the 708 offers.

Help – Administration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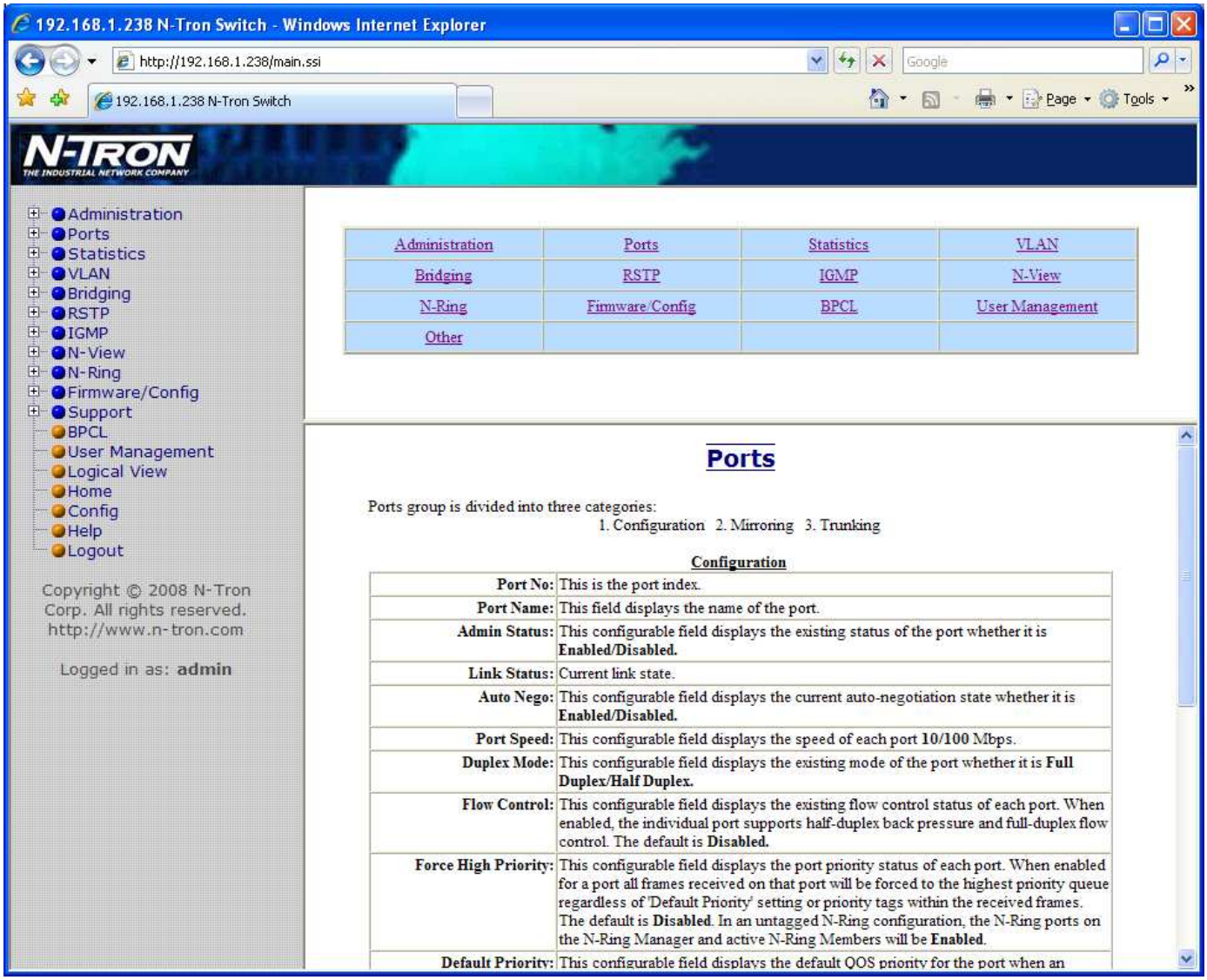
User Management
Other
Administration
Administration group is divided into three categories:
1. System 2. SNMP 3. Fault
System
IP Address: Contains the configured IP Address of the device.
Subnet Mask: Contains the configured Subnet Mask of the device.
Gateway: Contains the configured Default Gateway of the device.
MAC Address: MAC Address of the device.
System Up Time: This parameter represents the total time count. This time has elapsed since the switch was turned ON or RESET.
System Name: It shows the name of the product, which allows alphanumeric and special characters (#, _, -) only.
Contact: The person to contact for system issues, which should be someone within your organization.
Location: The physical location of the switch.
Limitations: The configurable parameters System Name, Contact and Location allow alphanumeric characters and special characters (#, _, -) only.
SNMP
IP Address - Trap Stn.#1 - #5: These configurable fields represent the IP Addresses of the Management Stations to send SNMP Traps.
Get Community Name: This configurable field represents the Authorized Community Name for SNMP Get requests. Default Get Community Name is "public"

Following the Administration link on the help page, the administrator or user can see some information regarding the configuration options in the Administration category on the left side of the web management.

Help – Ports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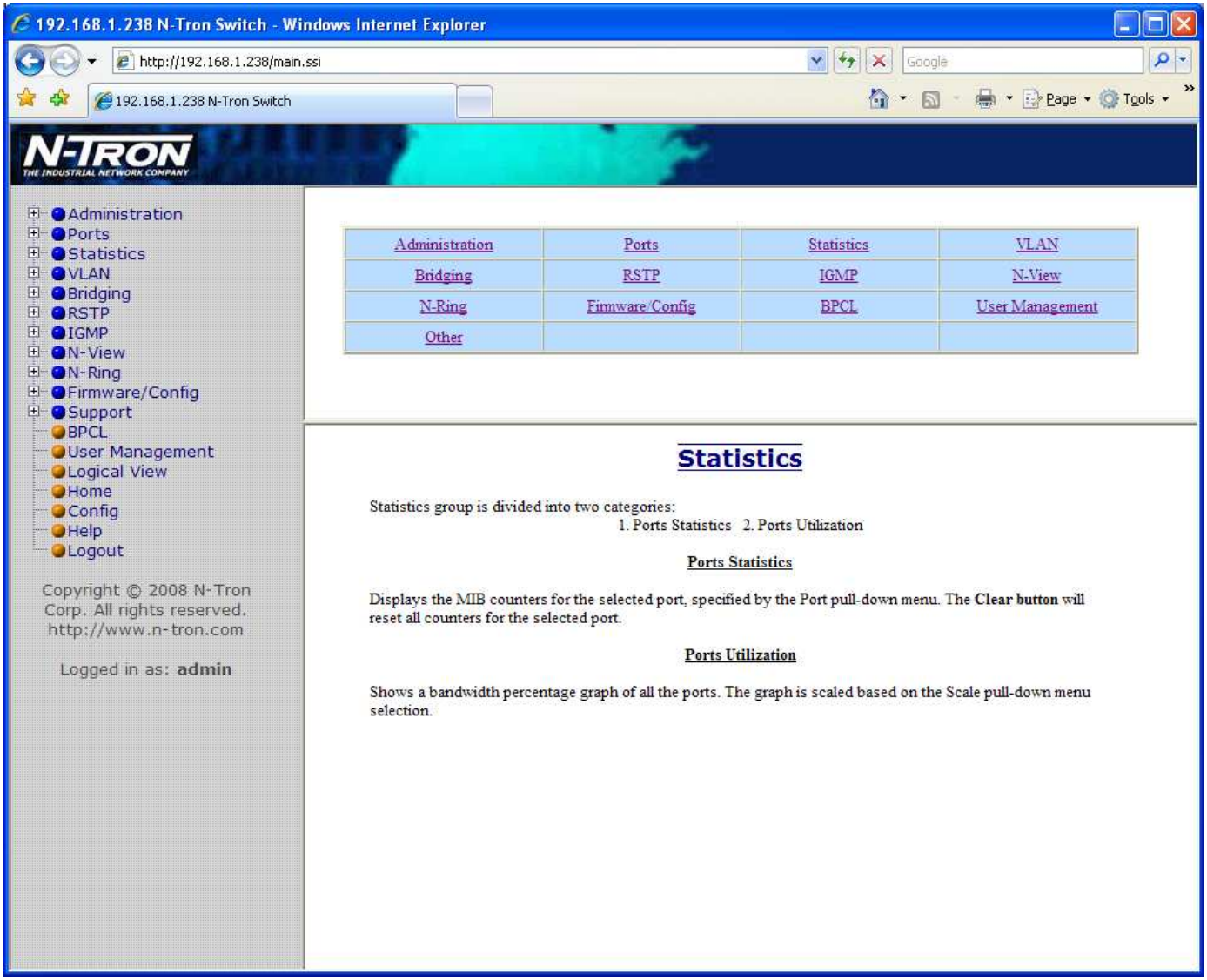
Ports
Ports group is divided into three categories:
1. Configuration 2. Mirroring 3. Trunking
Configuration
Port No: This is the port index.
Port Name: This field displays the name of the port.
Admin Status: This configurable field displays the existing status of the port whether it is Enabled/Disabled.
Link Status: Current link state.
Auto Nego: This configurable field displays the current auto-negotiation state whether it is Enabled/Disabled.
Port Speed: This configurable field displays the speed of each port 10/100 Mbps.
Duplex Mode: This configurable field displays the existing mode of the port whether it is Full Duplex/Half Duplex.
Flow Control: This configurable field displays the existing flow control status of each port. When enabled, the individual port supports half-duplex back pressure and full-duplex flow control. The default is Disabled.
Force High Priority: This configurable field displays the port priority status of each port. When enabled for a port all frames received on that port will be forced to the highest priority queue regardless of 'Default Priority' setting or priority tags within the received frames. The default is Disabled. In an untagged N-Ring configuration, the N-Ring ports on the N-Ring Manager and active N-Ring Members will be Enabled.
Default Priority: This configurable field displays the default QOS priority for the port when an

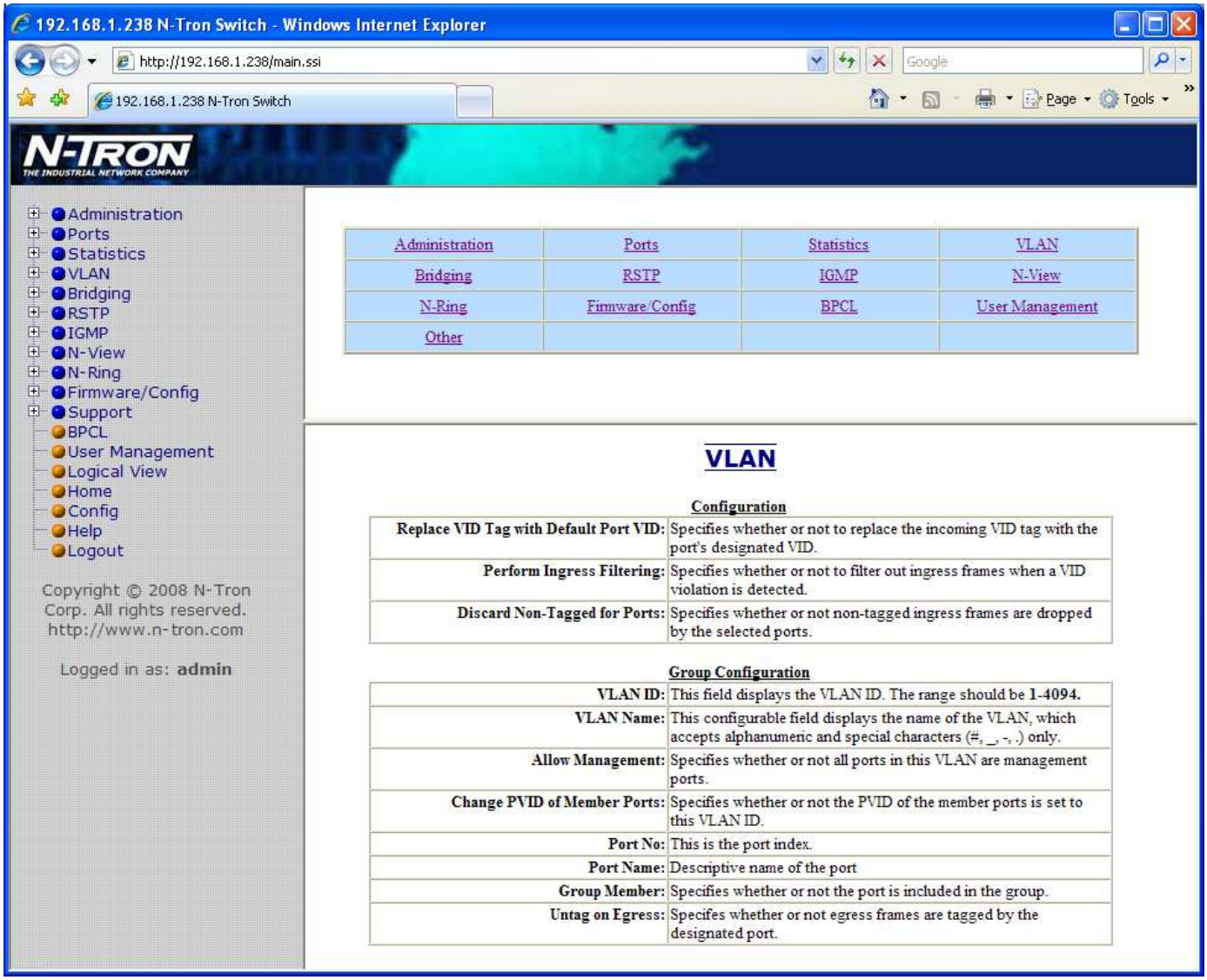
Following the Ports link on the help page, the administrator or user can see some information regarding the configuration options in the Ports category on the left side of the web management.

Help – Statistics



Following the Statistics link on the help page, the administrator or user can see some information regarding the configuration options in the Statistics category on the left side of the web management.

Help – VLAN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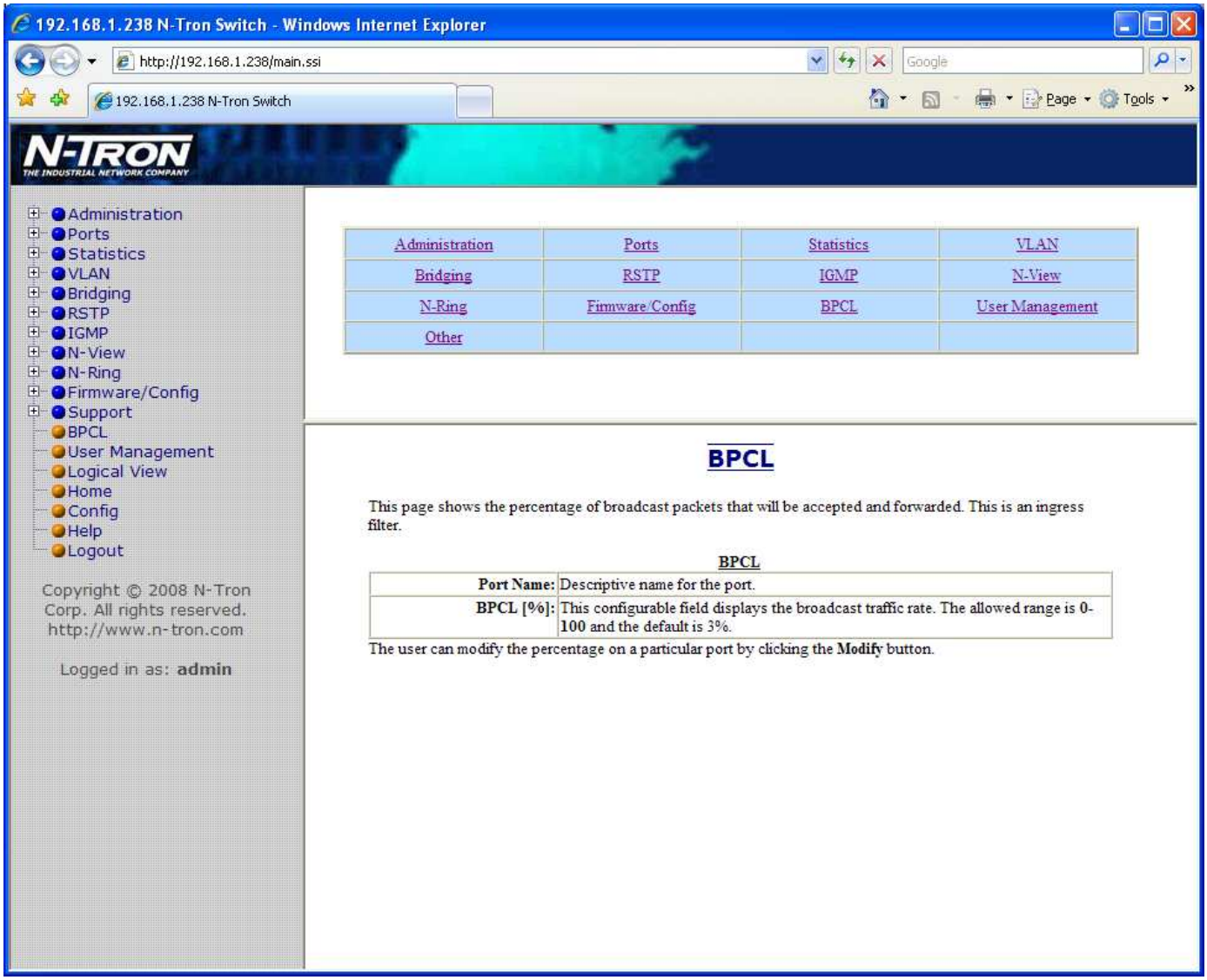
Configuration
Replace VID Tag with Default Port VID: Specifies whether or not to replace the incoming VID tag with the port's designated VID.
Perform Ingress Filtering: Specifies whether or not to filter out ingress frames when a VID violation is detected.
Discard Non-Tagged for Ports: Specifies whether or not non-tagged ingress frames are dropped by the selected ports.
Group Configuration
VLAN ID: This field displays the VLAN ID. The range should be 1-4094.
VLAN Name: This configurable field displays the name of the VLAN, which accepts alphanumeric and special characters (#, _, -, .) only.
Allow Management: Specifies whether or not all ports in this VLAN are management ports.
Change PVID of Member Ports: Specifies whether or not the PVID of the member ports is set to this VLAN ID.
Port No: This is the port index.
Port Name: Descriptive name of the port
Group Member: Specifies whether or not the port is included in the group.
Untag on Egress: Specifes whether or not egress frames are tagged by the designated port.

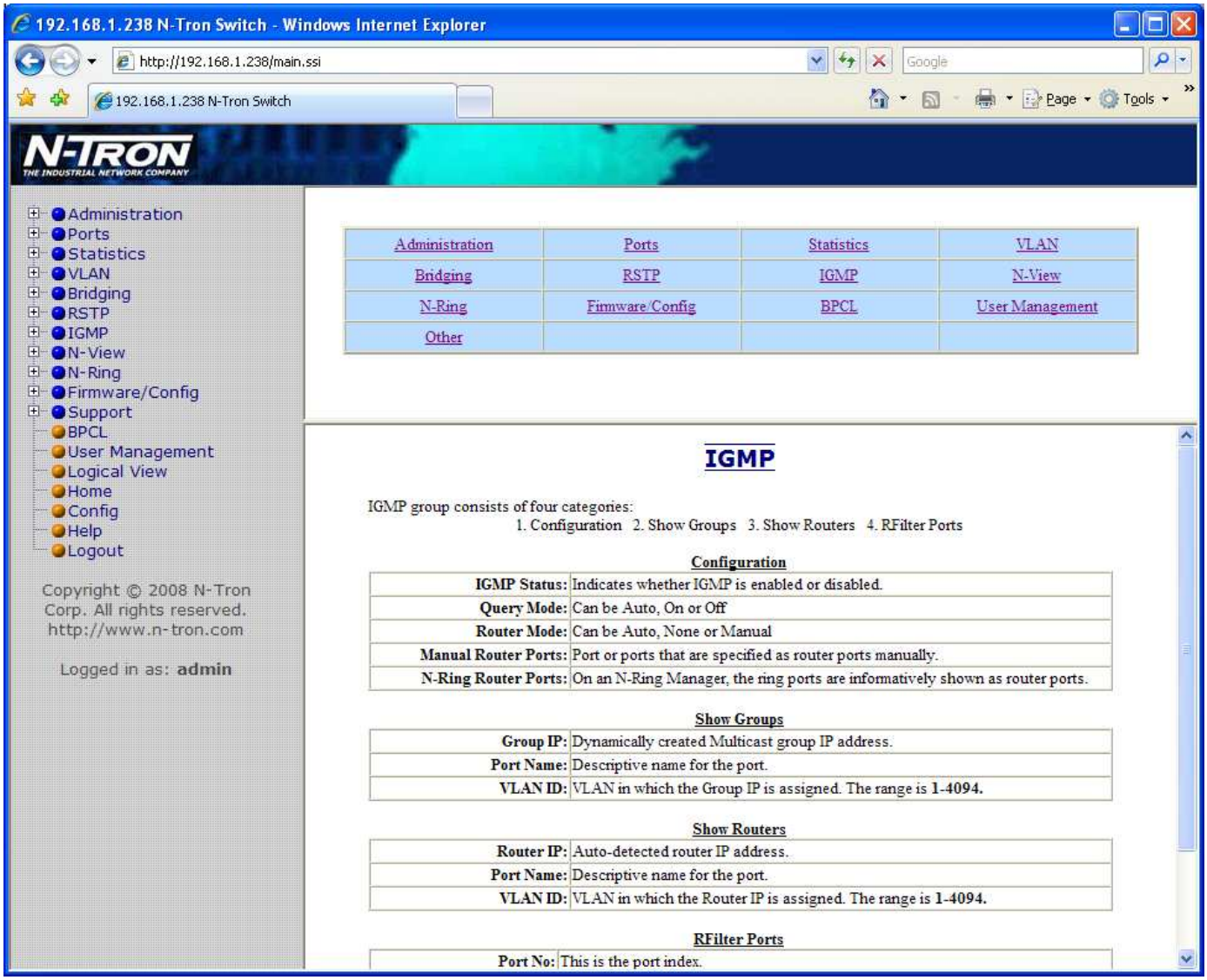
Following the VLAN link on the help page, the administrator or user can see some information regarding the configuration options in the VLAN category on the left side of the web management.

Help – BPCL



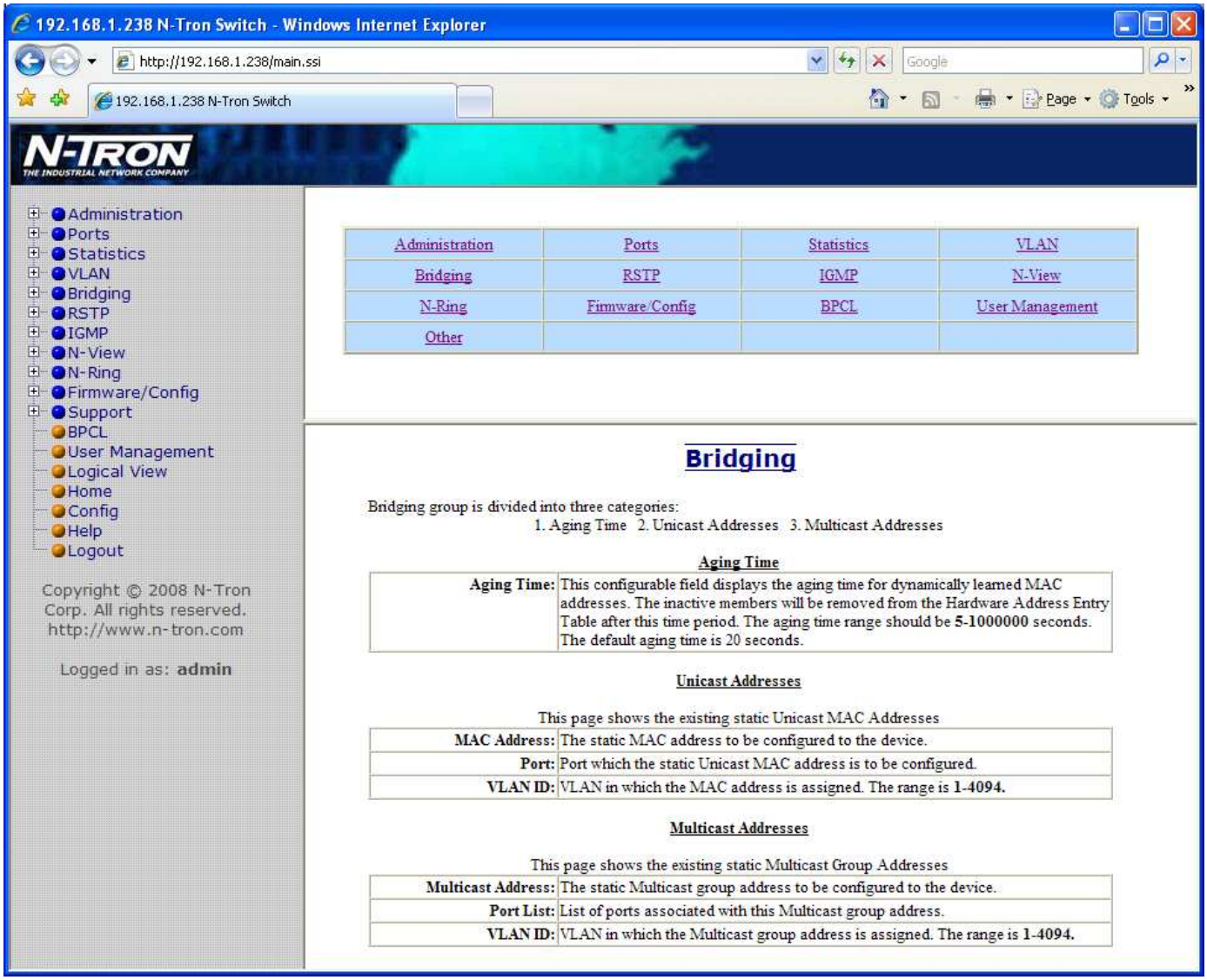
Following the BPCL link on the help page, the administrator or user can see some information regarding the configuration options in the BPCL category on the left side of the web management.

Help – IGMP



Following the IGMP link on the help page, the administrator or user can see some information regarding the configuration options in the IGMP category on the left side of the web management.

Help – Bridging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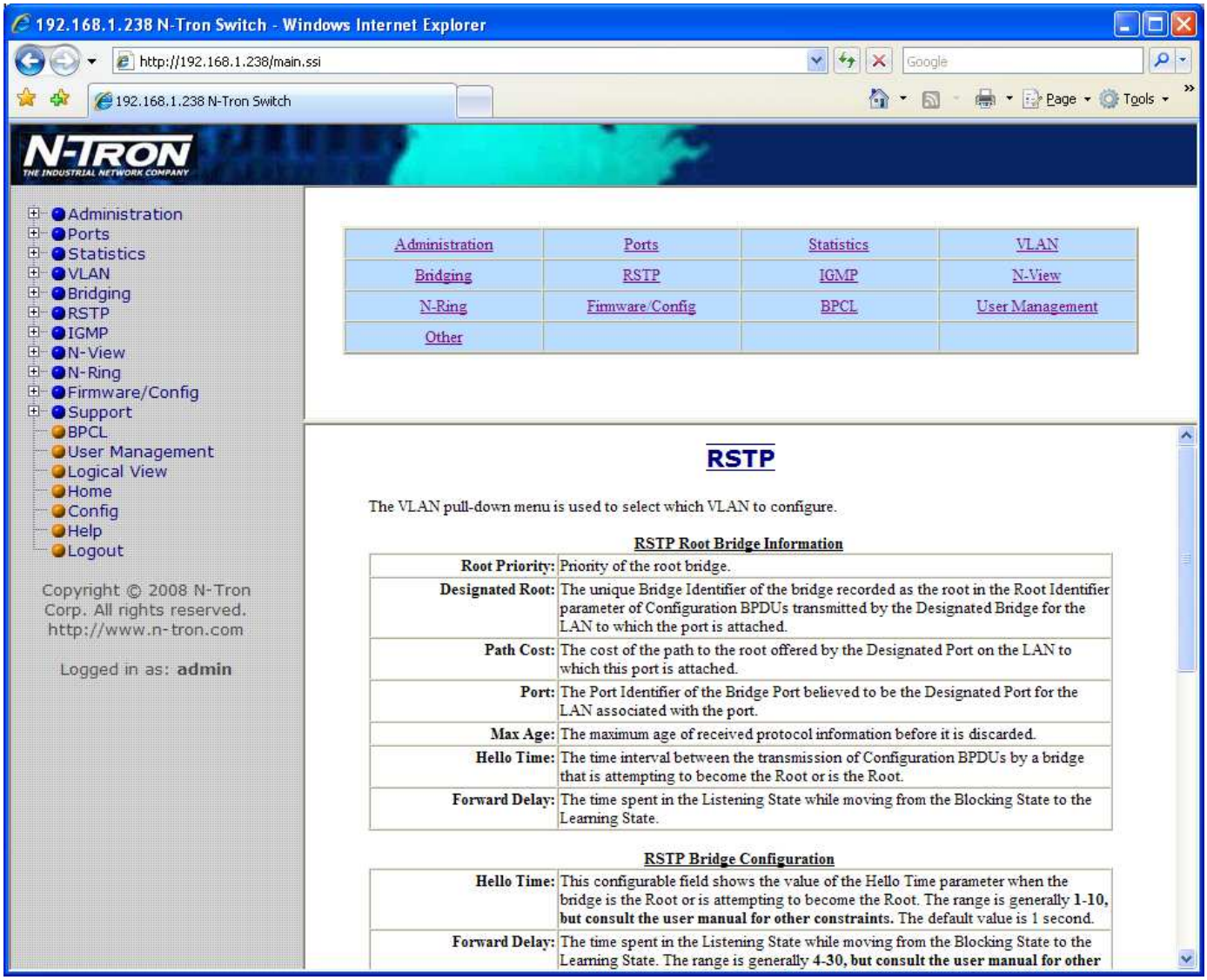
Bridging
Bridging group is divided into three categories:
1. Aging Time 2. Unicast Addresses 3. Multicast Addresses
Aging Time
Aging Time: This configurable field displays the aging time for dynamically learned MAC addresses. The inactive members will be removed from the Hardware Address Entry Table after this time period. The aging time range should be 5-1000000 seconds. The default aging time is 20 seconds.
Unicast Addresses
This page shows the existing static Unicast MAC Addresses
MAC Address: The static MAC address to be configured to the device.
Port: Port which the static Unicast MAC address is to be configured.
VLAN ID: VLAN in which the MAC address is assigned. The range is 1-4094.
Multicast Addresses
This page shows the existing static Multicast Group Addresses
Multicast Address: The static Multicast group address to be configured to the device.
Port List: List of ports associated with this Multicast group address.
VLAN ID: VLAN in which the Multicast group address is assigned. The range is 1-4094.

Following the Bridging link on the help page, the administrator or user can see some information regarding the configuration options in the Bridging category on the left side of the web management.

Help – RSTP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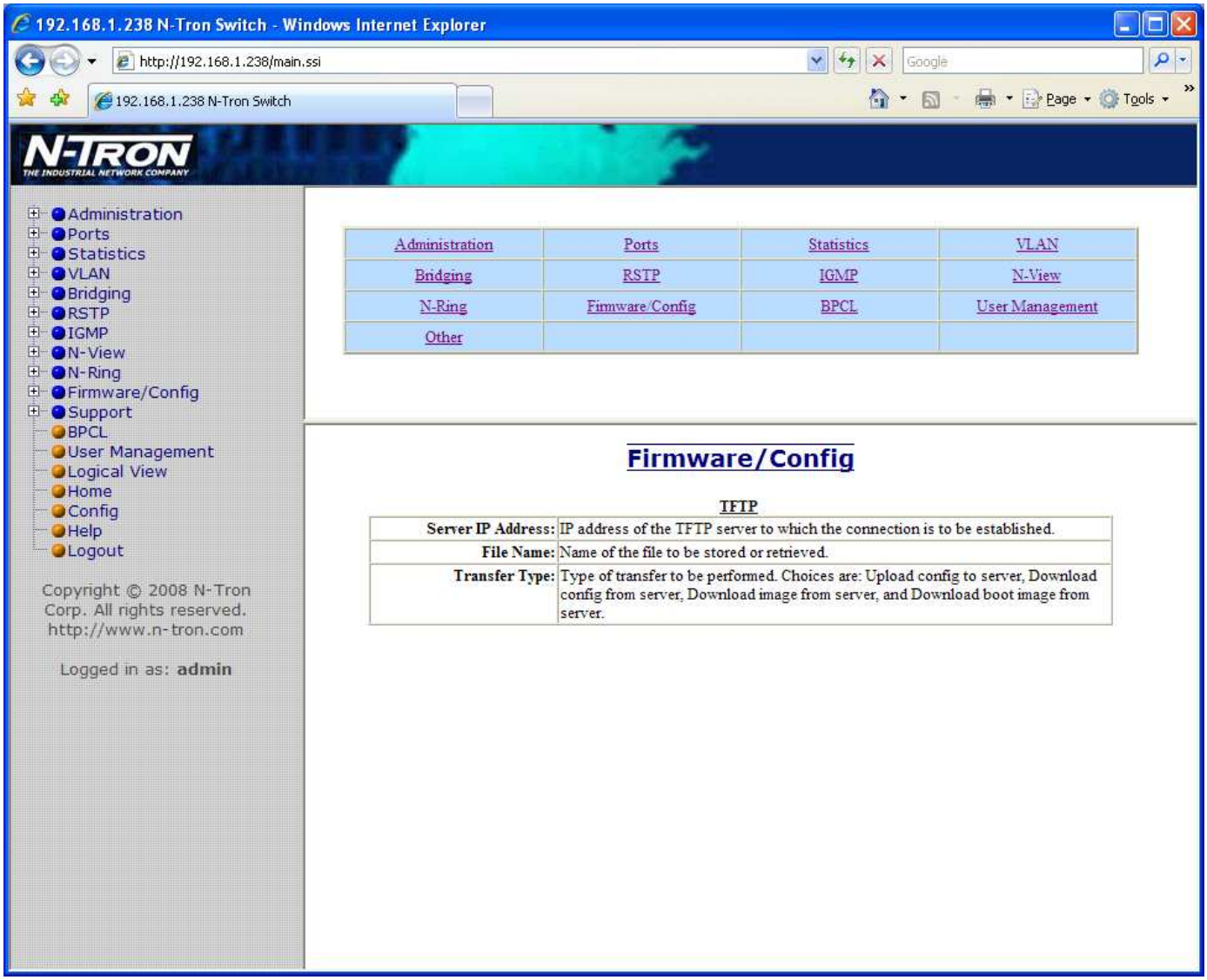
RSTP
The VLAN pull-down menu is used to select which VLAN to configure.
RSTP Root Bridge Information
Root Priority: Priority of the root bridge.
Designated Root: The unique Bridge Identifier of the bridge recorded as the root in the Root Identifier parameter of Configuration BPDUs transmitted by the Designated Bridge for the LAN to which the port is attached.
Path Cost: The cost of the path to the root offered by the Designated Port on the LAN to which this port is attached.
Port: The Port Identifier of the Bridge Port believed to be the Designated Port for the LAN associated with the port.
Max Age: The maximum age of received protocol information before it is discarded.
Hello Time: The time interval between the transmission of Configuration BPDUs by a bridge that is attempting to become the Root or is the Root.
Forward Delay: The time spent in the Listening State while moving from the Blocking State to the Learning State.
RSTP Bridge Configuration
Hello Time: This configurable field shows the value of the Hello Time parameter when the bridge is the Root or is attempting to become the Root. The range is generally 1-10, but consult the user manual for other constraints. The default value is 1 second.
Forward Delay: The time spent in the Listening State while moving from the Blocking State to the Learning State. The range is generally 4-30, but consult the user manual for other

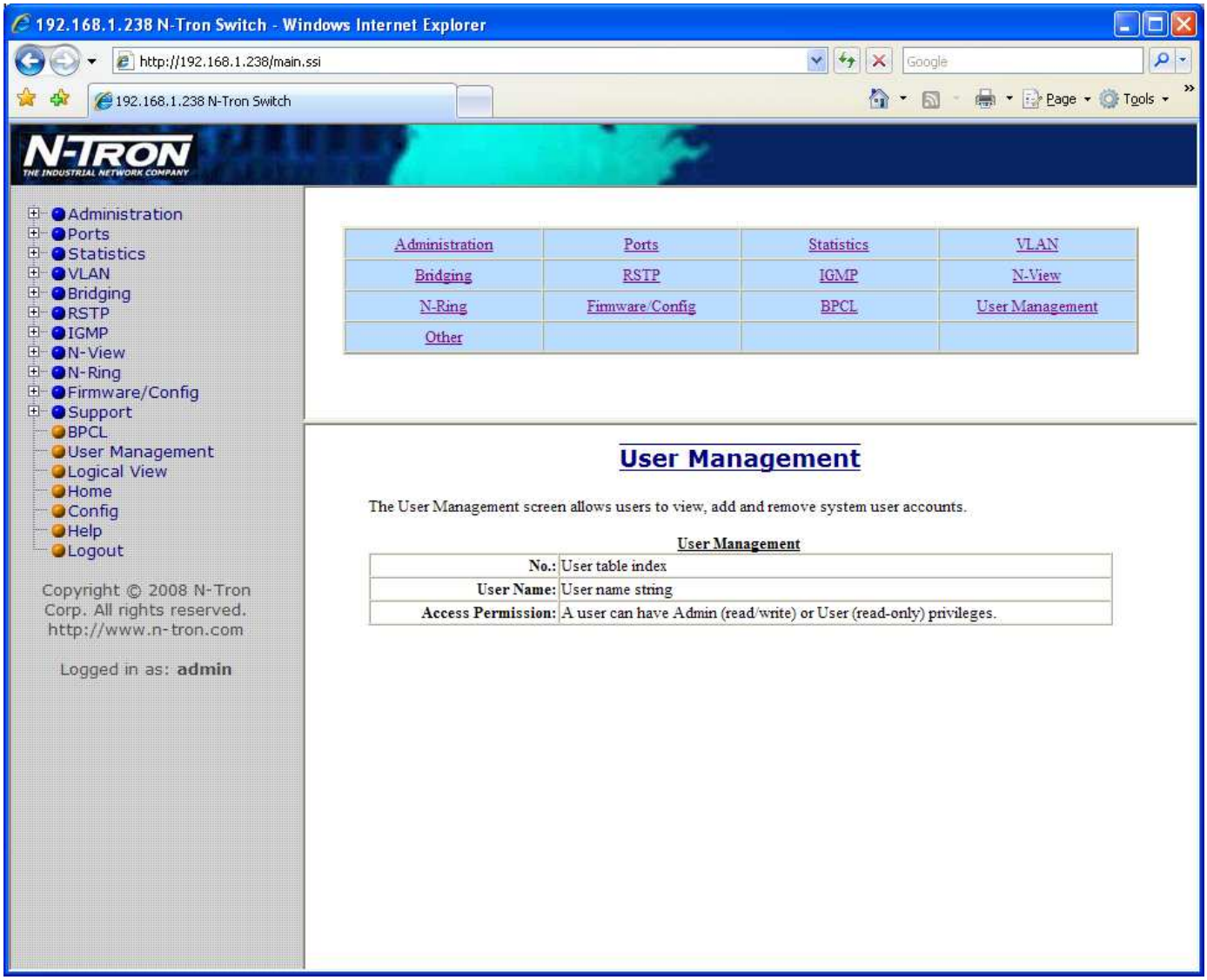
Following the RSTP link on the help page, the administrator or user can see some information regarding the configuration options in the RSTP category on the left side of the web management.

Help – Firmware/Config



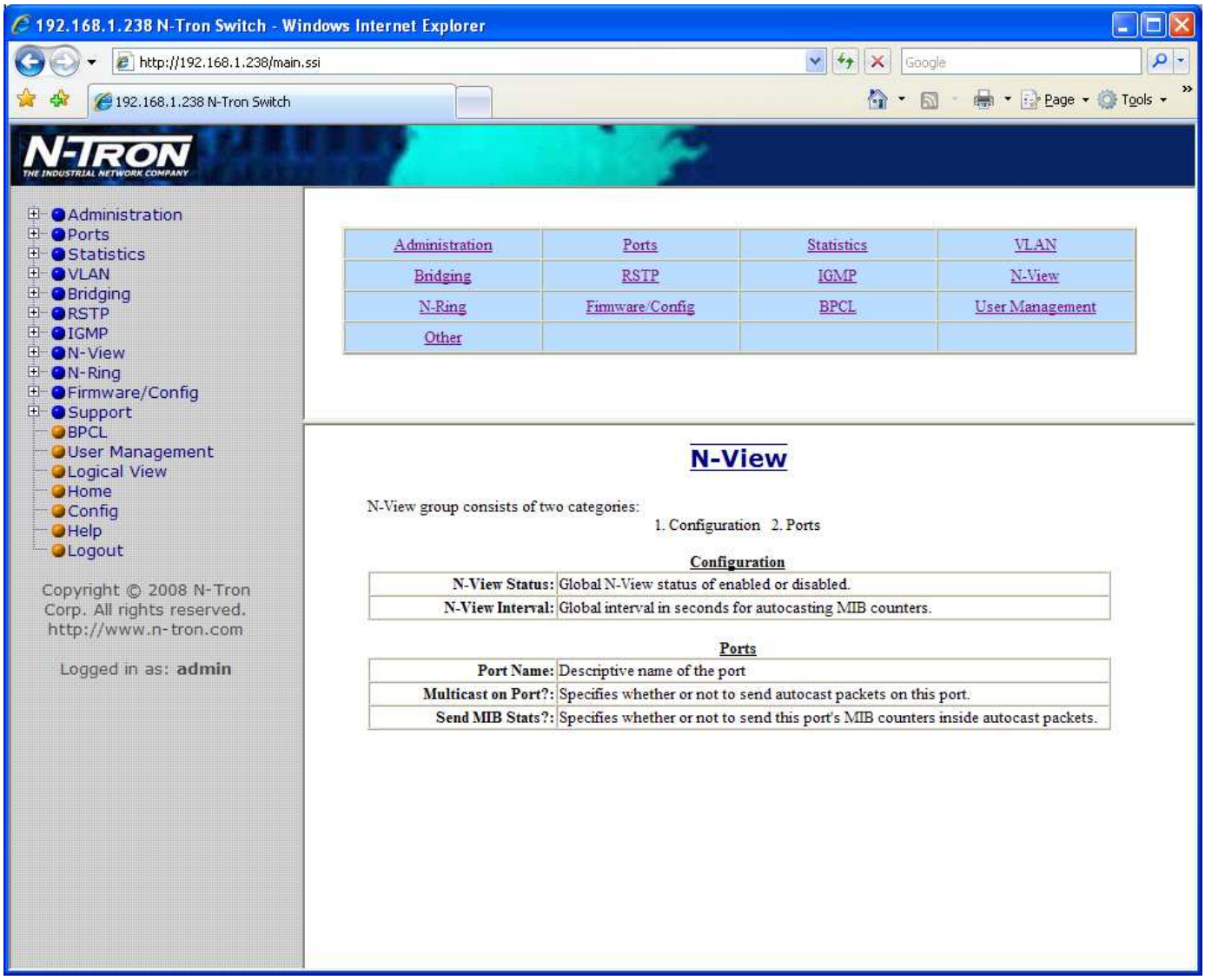
Following the Firmware/Config link on the help page, the administrator or user can see some information regarding the configuration options in the Firmware/Config category on the left side of the web management.

Help – User Management



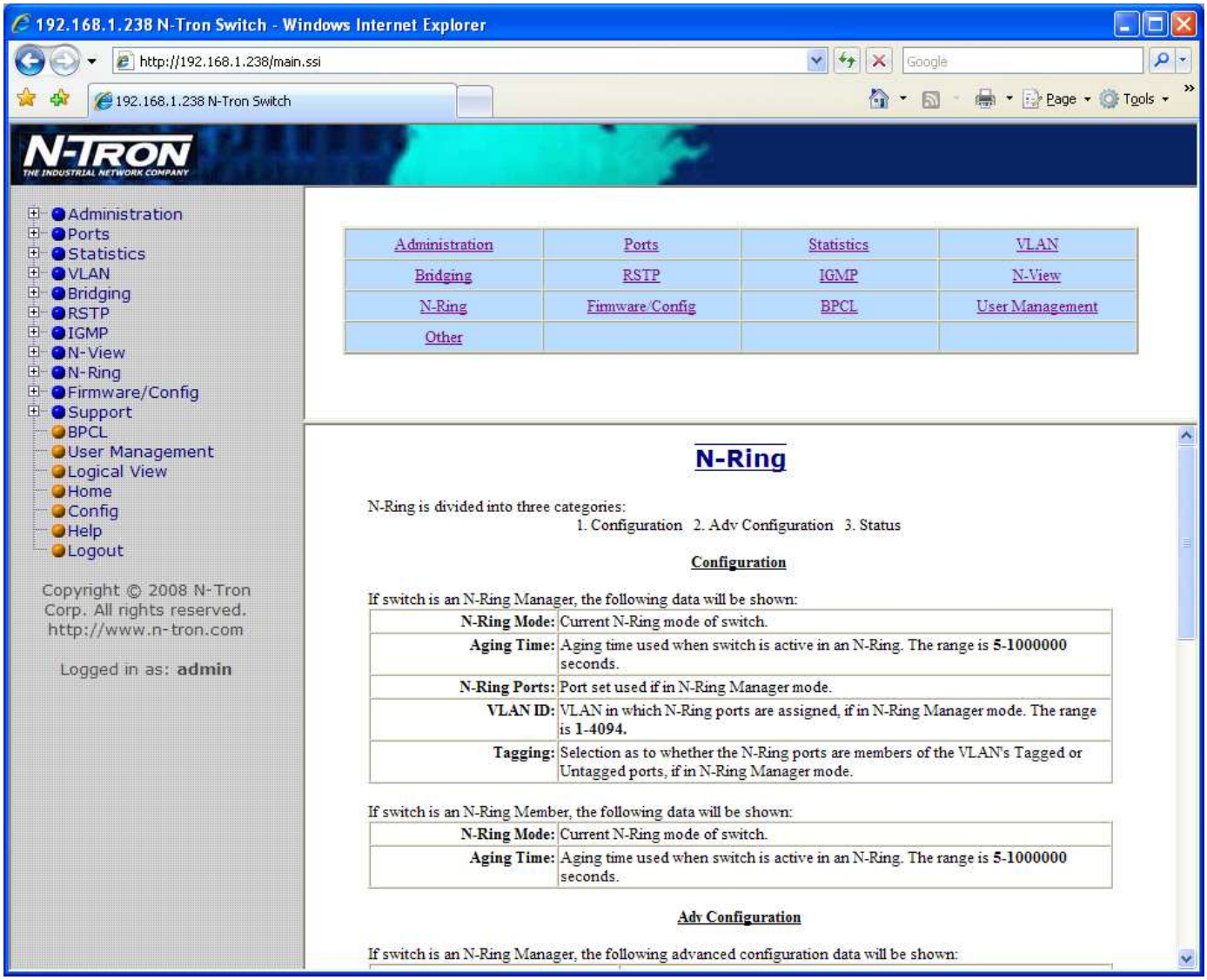
Following the User Management link on the help page, the administrator or user can see some information regarding the configuration options in the User Management category on the left side of the web management.

Help – N-View



Following the N-View link on the help page, the administrator or user can see some information regarding the configuration options in the N-View category on the left side of the web management.

Help – N-Ring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N-View
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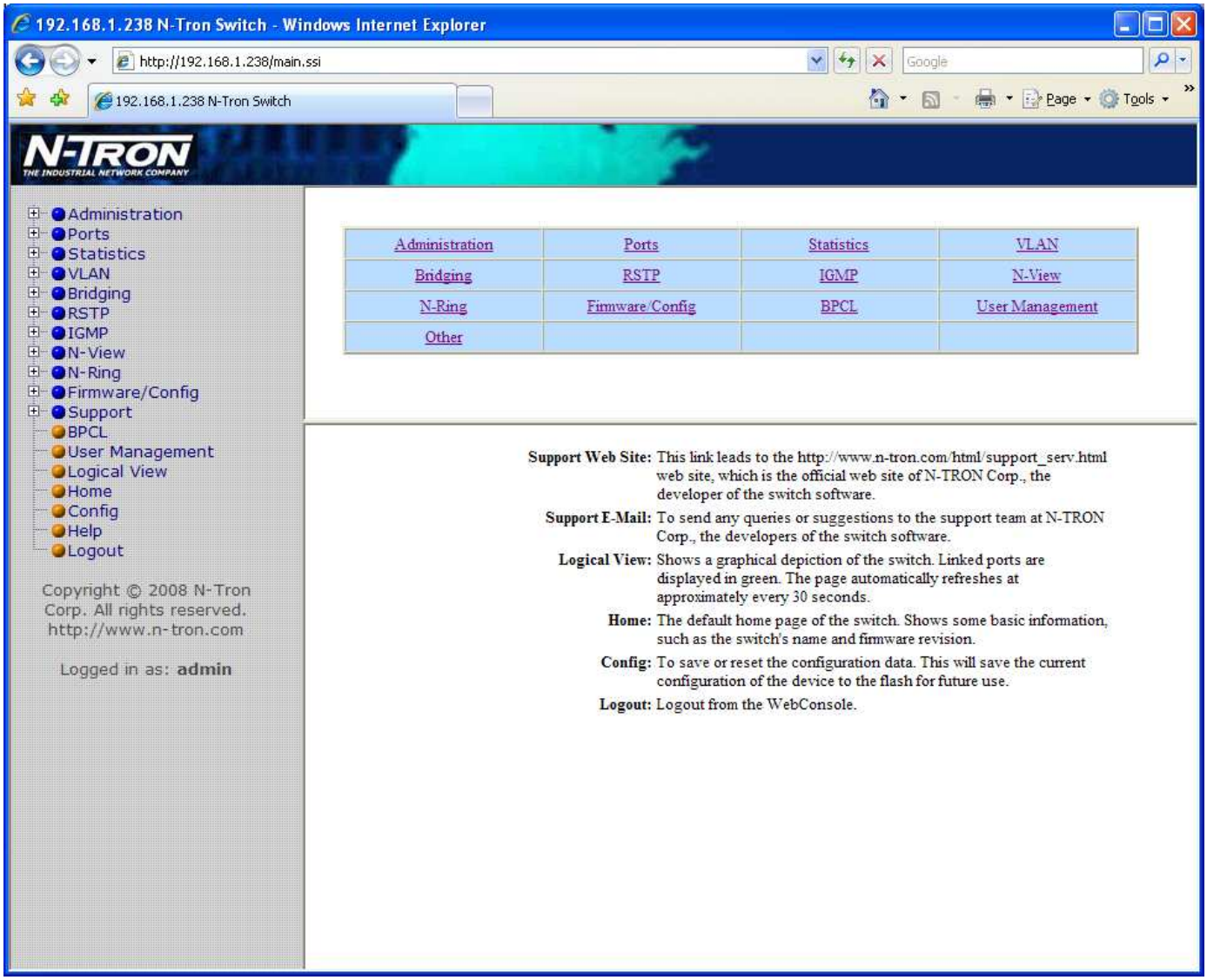
BPCL
User Management
Other
N-Ring
N-Ring is divided into three categories:
1. Configuration 2. Adv Configuration 3. Status
Configuration
If switch is an N-Ring Manager, the following data will be shown:
N-Ring Mode: Current N-Ring mode of switch.
Aging Time: Aging time used when switch is active in an N-Ring. The range is 5-1000000 seconds.
N-Ring Ports: Port set used if in N-Ring Manager mode.
VLAN ID: VLAN in which N-Ring ports are assigned, if in N-Ring Manager mode. The range is 1-4094.
Tagging: Selection as to whether the N-Ring ports are members of the VLAN's Tagged or Untagged ports, if in N-Ring Manager mode.
If switch is an N-Ring Member, the following data will be shown:
N-Ring Mode: Current N-Ring mode of switch.
Aging Time: Aging time used when switch is active in an N-Ring. The range is 5-1000000 seconds.
Adv Configuration
If switch is an N-Ring Manager, the following advanced configuration data will be shown:

Following the N-Ring link on the help page, the administrator or user can see some information regarding the configuration options in the N-Ring category on the left side of the web management.

Help – Other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Bridging
RSTP
IGMP
N-View
N-Ring
Firmware/Config
BPCL
User Management
Other
Support Web Site: This link leads to the http://www.n-tron.com/html/support_serv.html web site, which is the official web site of N-TRON Corp., the developer of the switch software.
Support E-Mail: To send any queries or suggestions to the support team at N-TRON Corp., the developers of the switch software.
Logical View: Shows a graphical depiction of the switch. Linked ports are displayed in green. The page automatically refreshes at approximately every 30 seconds.
Home: The default home page of the switch. Shows some basic information, such as the switch's name and firmware revision.
Config: To save or reset the configuration data. This will save the current configuration of the device to the flash for future use.
Logout: Logout from the WebConsole.

Following the Other link on the help page, the administrator or user can see some information regarding other links or categories on the left hand side of the web manager, as above.

CLI Commands

"?" (Help)

Command Name	**"?"**
Description	Show a list of all commands or get help on a specific command. Without *cmd*, this command will list all the available commands. If *cmd* is specified and if it matches a specific command, the **usage** of the command will be displayed; otherwise, if *cmd* matches the prefix of a command, the name of the command will be listed. If **?** is preceded by another **?**, the usage and description of this command will be displayed.
Syntax	**?** [cmd]
Parameters	**cmd** The command for which to get help.
Examples	**N-TRON/Admin> ?** *The above command displays all the available commands.* **N-TRON/Admin> abcd ?** Unknown Command: "abcd" Type "?" for a list of available commands. **N-TRON/Admin> logout ?** Logout Log out of console interface. SYNTAX: Logout **N-TRON/Admin> ? pi** Ping Ping a host. … **N-TRON/Admin> ? ?** ? Show a list of all commands or get help on a specific command. SYNTAX: ? [cmd] OPTIONS: cmd : The command for which to get help.
NOTES	

Logout

Command Name	**logout**
Description	Log out of console interface
Syntax	**logout**
Parameters	**None**
Examples	**N-TRON/Admin> logout**
NOTES	

CLI Commands, Continued…

Show, Add, or Delete ARL Entries

Command Name	**arl**
Description	Show, Add, or Delete Arl Entries.
Syntax	**arl** show | showmct | add mac port cpu static vid | del[ete] mac vid
Parameters	**show** Show entire ARL table. **showmct** Show entire ARL MCT (Multicast Index) table. **delete** Delete MAC address. **add** Add MAC address. **mac** MAC Address. **port** Port Number. **cpu** 1 = Send to CPU also. **static** 1 = This is a static address; 0 = Non-Static. **vid** VLAN ID (0-4095)
Example	**N-TRON/Admin> arl show** No. Val Age Pri Mod Usr Sta VLAN MAC Port(s) ---- --- --- --- --- --- --- ---- ----------------- ---------- 1 1 1 0 0 0 1 1 00:07:af:ff:b8:00 CPU 2 1 0 0 0 0 0 1 00:19:b9:03:aa:77 TX3 **N-TRON/Admin> arl showmct** No. Idx Val Port Mask Port(s) --- --- --- ---------- ---------- 1 0 1 0x00000000 (None) 2 1 1 0x00000001 TX1 **N-TRON/Admin> arl add 00:19:b9:03:aa:79 3 0 1 1** **N-TRON/Admin> arl del 00:19:b9:03:aa:79 1**
Notes	

CLI Commands, Continued…

Save or Reset the Configuration Settings

Command Name	**config**
Description	Save or reset configuration settings
Syntax	**config** s[ave] | r[eset]
Parameters	**save** save current running configuration settings. **reset** reset configuration settings to factory defaults.
Examples	**N-TRON/Admin> config save** Save Settings... Settings have been saved. **N-TRON/Admin> config reset** Resetting to factory defaults... Load factory default settings [y/n]?y Keep IP, subnet mask, and gateway addresses [y/n]?y Keep current user names and passwords [y/n]?y …
NOTES	

Dongle Operations

Command Name	**dongle**
Description	Perform dongle operations
Syntax	**dongle** info | format [-m model] | compare | erase
Parameters	**info** Show information about the dongle (factory access only). **format** Format the dongle to factory default (factory access only). **-m model** Dongle model number: 1=At32K or 2=At64K (default) **compare** Compare the configuration on the dongle to the switch. **erase** Erase the switch configuration on the dongle.
Examples	**N-TRON/Admin> dongle compare** Comparing dongle configuration... The configurations are identical. **N-TRON/Admin> dongle erase** Erasing dongle... Dongle erase completed.
NOTES	

Ping a Host

Command Name	**ping**
Description	Ping a host
Syntax	**ping** [-t] [-n count] [-w timeout] target_name
Parameters	**target_name** IP Address or host name. **-t** Ping the specified host until stopped. To see statistics and continue - type Space; To stop - type Control-C. **-n count** Number of echo requests to send. **-w timeout** Timeout in milliseconds to wait for each reply.
Example	**N-TRON/Admin> ping 192.168.1.119** **…** **N-TRON/Admin> ping –n 6 192.168.1.119** **…** **N-TRON/Admin> ping –t 192.168.1.119** **…** **N-TRON/Admin> ping –w 2000 192.168.1.119** Reply from 192.168.1.119: time=970ms Reply from 192.168.1.119: time<10ms Reply from 192.168.1.119: time<10ms Ping statistics for 192.168.1.119: Packets: Sent = 4, Received = 3, Lost = 1 (25% loss) Approximate round trip times in milliseconds: Minimum = 0ms, Maximum = 970ms, Average = 320ms
Notes	

Reset the Switch

Command Name	**reset**
Description	Reset (reboot) the switch
Syntax	**reset**
Parameters	**None**
Example	**N-TRON/Admin> reset** Performing Soft-Reset... …
Notes	

Show or Clear the Last System Error

Command Name	**syserr**
Description	Show or clear the last system error If *clear* is not supplied, then the last system error is displayed.
Syntax	**syserr** [clear]
Parameters	**clear** Clear the last system error.
Example	**N-TRON/Admin> syserr** Last System Error: None. **N-TRON/Admin> syserr clear** Last System Error: Cleared.
Notes	

CLI Commands, Continued…

Show System Information

Command Name	**sysinfo**
Description	Show system information
Syntax	**sysinfo**
Parameters	**None**
Example	**N-TRON/Admin> sysinfo** ++ + + N-Tron 700 Series + ++ + + Model: 708FX2 + Boot Loader: BL 1.0.1.2 (0x01000102) + OS Version: 1.0.5 + Build Date: Jan 29 2008 at 09:22:45 (0xFC100000) + Copyright: Copyright(c)2008 N-Tron Corp. All rights reserved. + + Processor: 66 MHz (66000000) + Flash Size: 8 MB + SDRAM Size: 16 MB + MAC Address: 00:07:af:ff:b8:00 + IP Address: 192.168.1.225 + Subnet Mask: 255.255.255.0 + Gateway: 192.168.1.1 + ++
Notes	

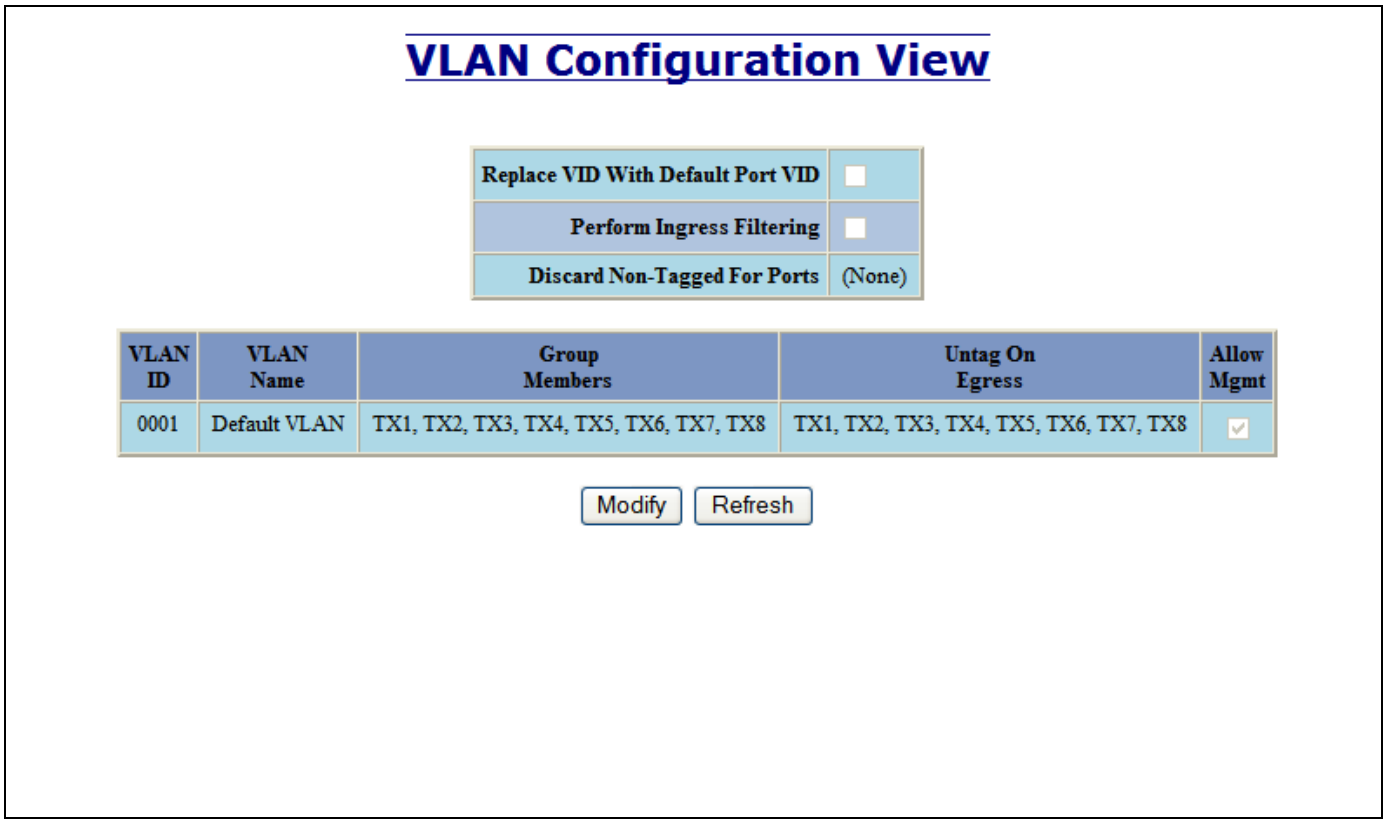
CLI Commands, Continued…

Set or Show the System IP Configuration

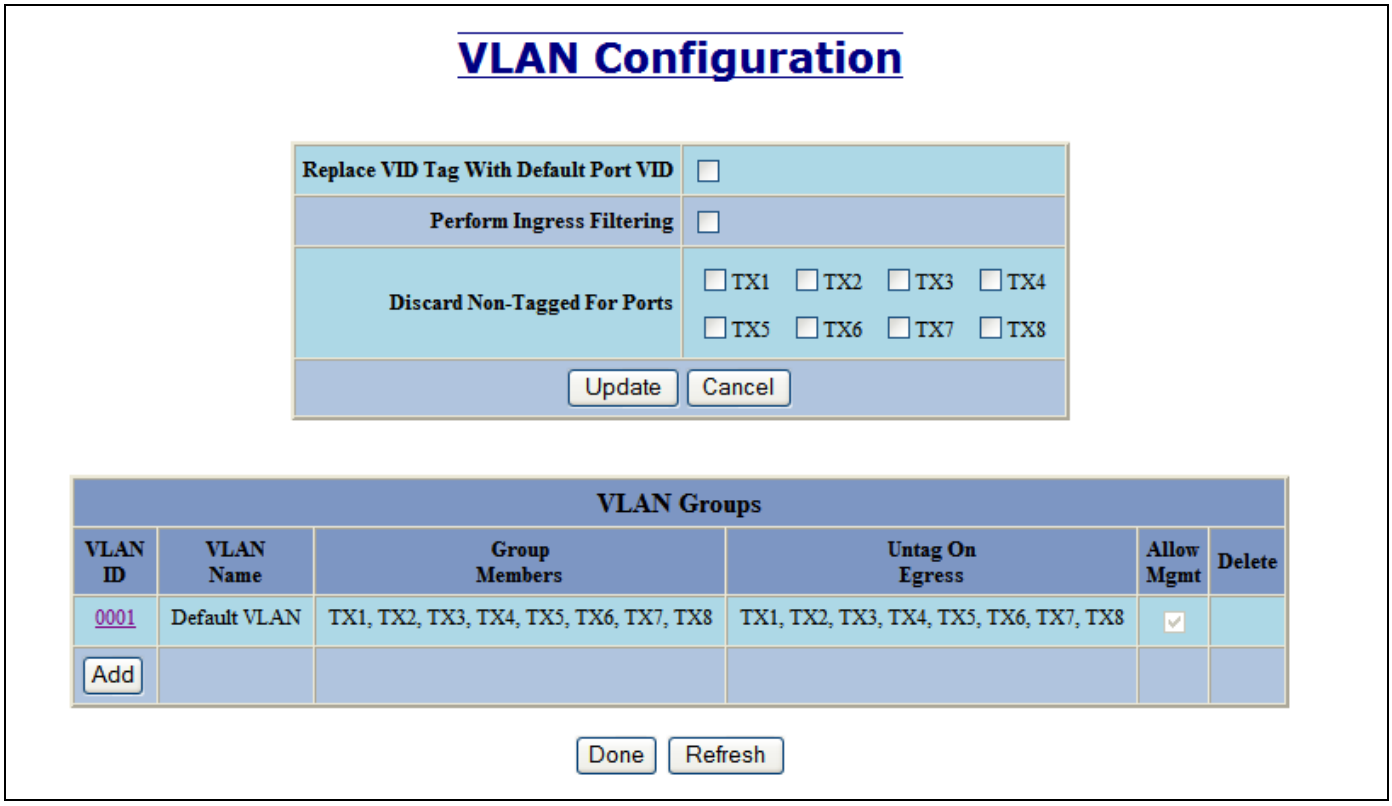
Command Name	**sysip**
Description	Set system IP configuration mode, IP address, subnet mask, and gateway If no parameters are specified, this command will show the system IP addresses. Static IP, subnet mask, or gateway can only be set while in static configuration mode. All system addresses must be formatted as: xxx.xxx.xxx.xxx.
Syntax	**sysip** [-c config_mode] [-i static_ip] [-s static_subnet_mask] [-g static_gateway]
Parameters	**-c config_mode** s(tatic) or d(hcp). **-i static_ip** Static IP address (for static config mode). **-s static_subnet_mask** Static sub net mask (for static config mode). **-g static_gateway** Static gateway address (for static config mode).
Example	**N-TRON/Admin> sysip** IP Configuration Mode : Static Static IP Address : 192.168.1.225 Static subnet Mask : 255.255.255.0 Static gateway : 192.168.1.1 **N-TRON/Admin> sysip -c dhcp** IP Configuration Mode : DHCP (has been changed) Static IP Address : 192.168.1.225 Static subnet Mask : 255.255.255.0 Static gateway : 192.168.1.1 Do you Want to Save Changes and Restart the System Now [y/n]? … **N-TRON/Admin> sysip -i 192.168.1.119 -s 225.225.225.0 -g 192.168.1.1** IP Configuration Mode : Static Static IP Address : 192.168.1.119 (has been changed) Static subnet Mask : 225.225.225.0 (has been changed) Static gateway : 192.168.1.1 (has been changed) Do you Want to Save Changes and Restart the System Now [y/n]? …
NOTES	

VLAN Addition and Deletion Example

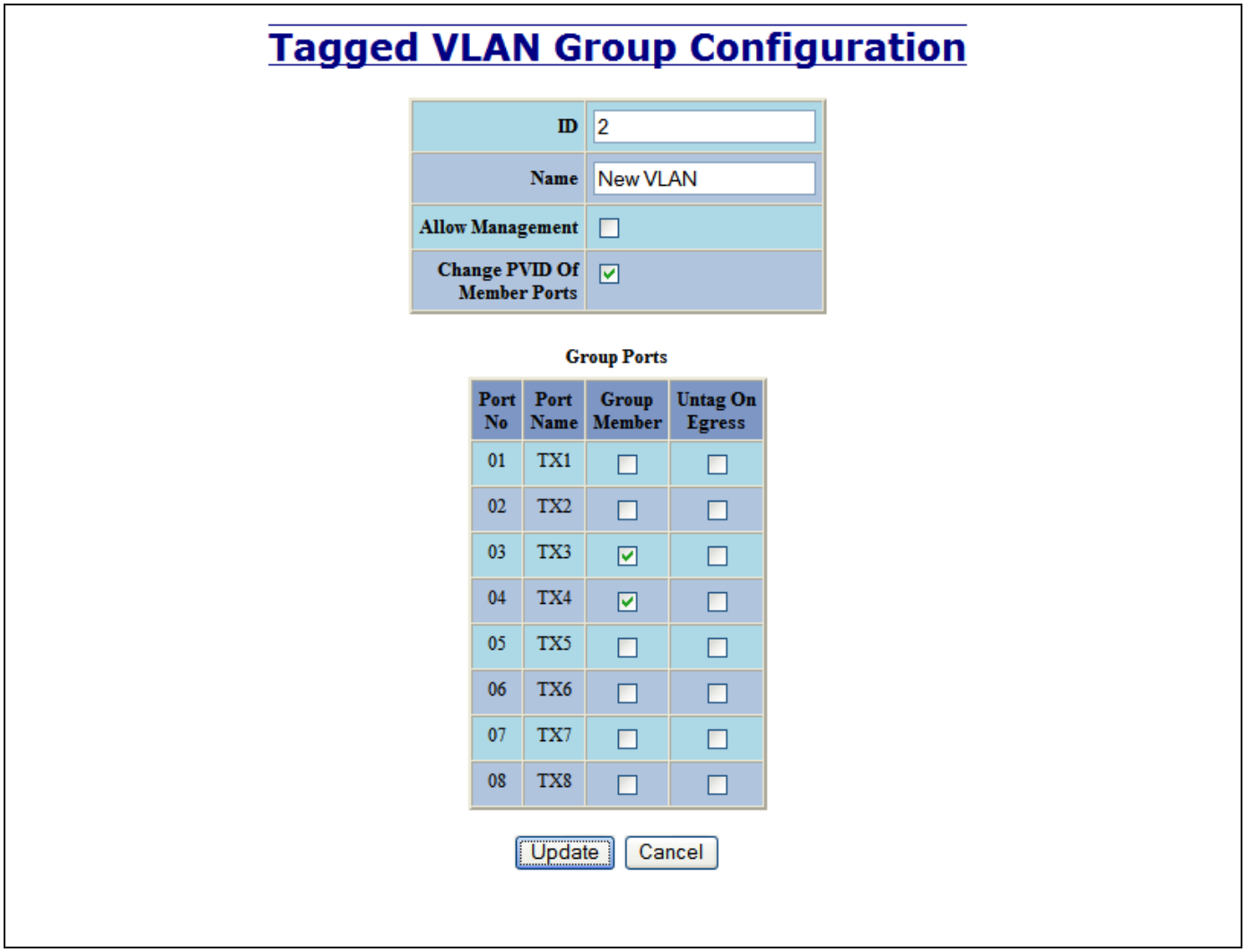
The screen capture below is the factory default VLAN configuration.



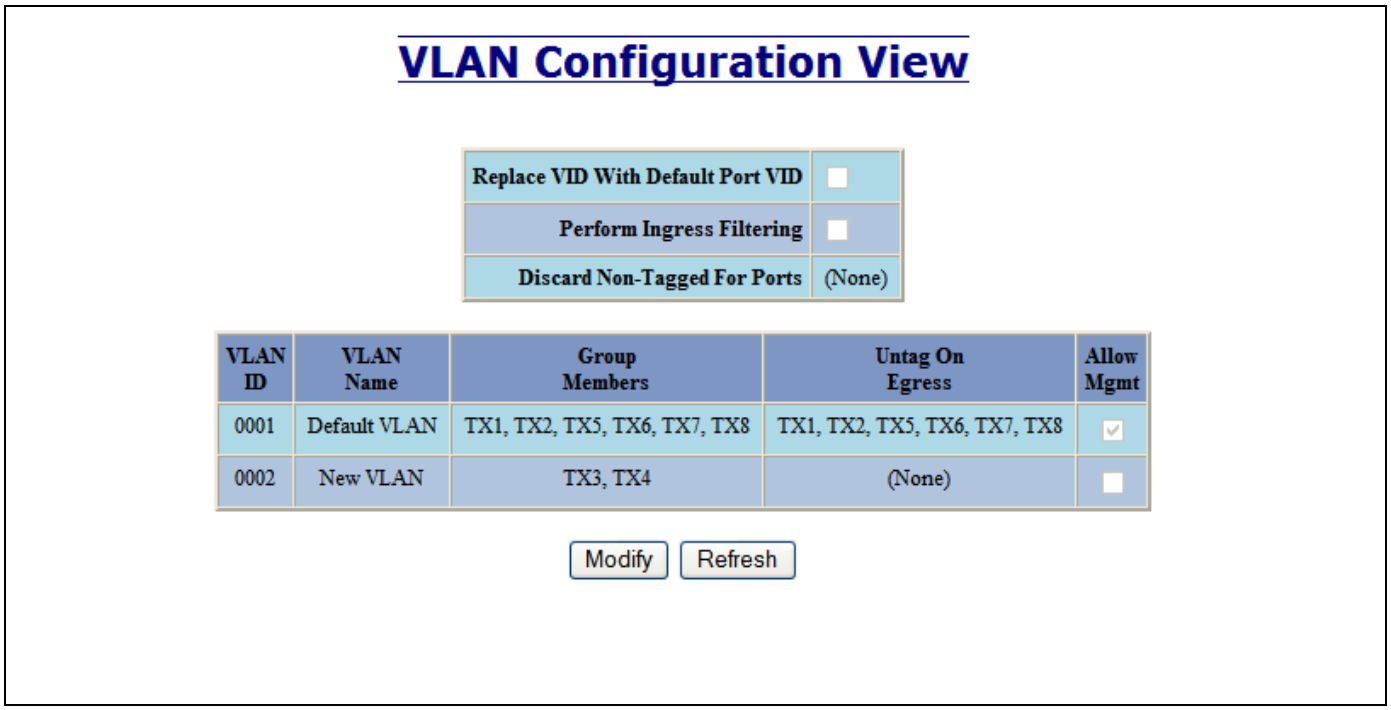
Clicking on the “Modify” button allows one to add a new VLAN:



When creating a new VLAN, a numeric ID is required, Name is entered. Note that N-Ring VLAN is a reserved name with a special meaning. Choices such as “Allow Management” and “Change PVID of Member Ports” are made at this time as well as the ports which are going to belong to the new VLAN. Additionally, the ports may be “Untagged on Egress”.

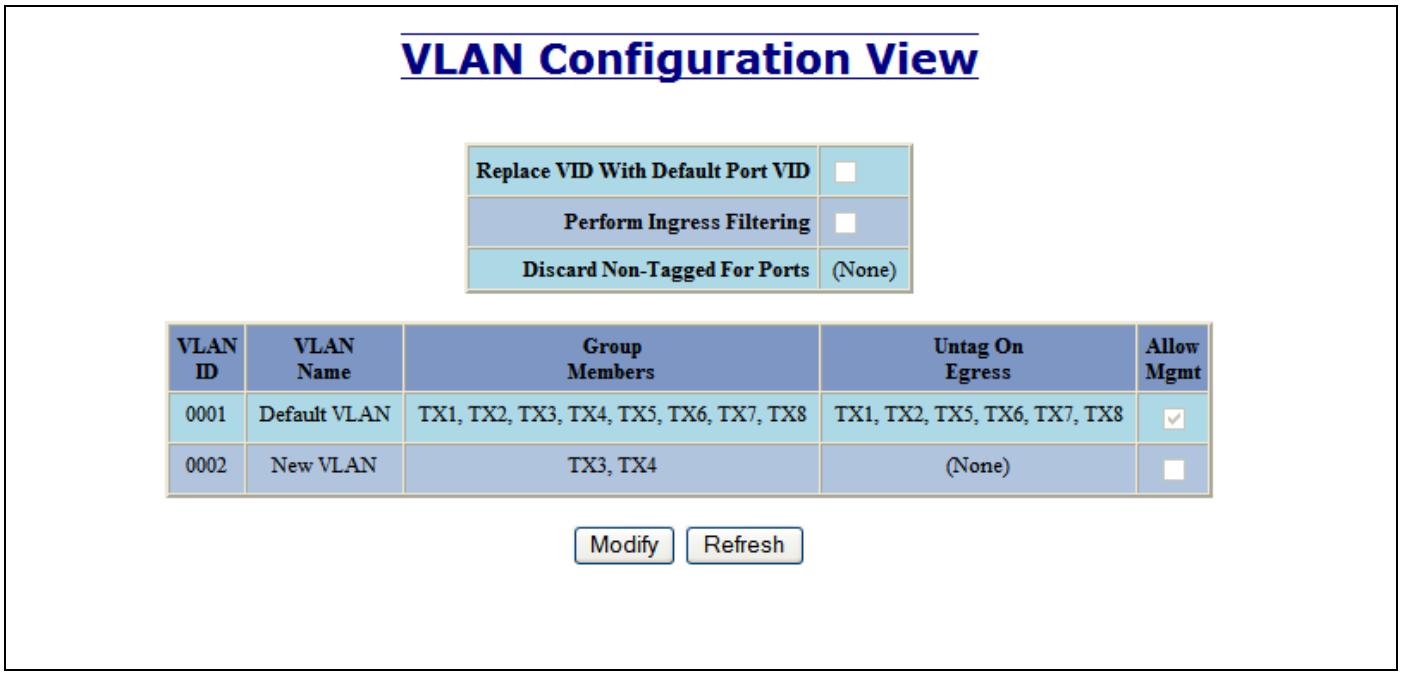


The result of add is a “New VLAN”. In this case, it does not overlap the “Default VLAN” ports.



The ports of ”New VLAN” may be added back to “Default VLAN” to create overlapping VLANs.

Note: If there are multiple ports on different VLANs, the 708 will apply the static multicast address to the lowest VLAN-ID that is associated with one of the ports assigned to the static multicast address. If the lowest VLAN-ID contains all the ports assigned to the static multicast address (an umbrella VLAN), it will function for all those ports with no problems. This can be achieved with overlapping VLANs.



But notice that the ports in “New VLAN” are not marked as “Untag on Egress” and are thus still tagged.

And the “New VLAN” may be deleted when it is no longer required:

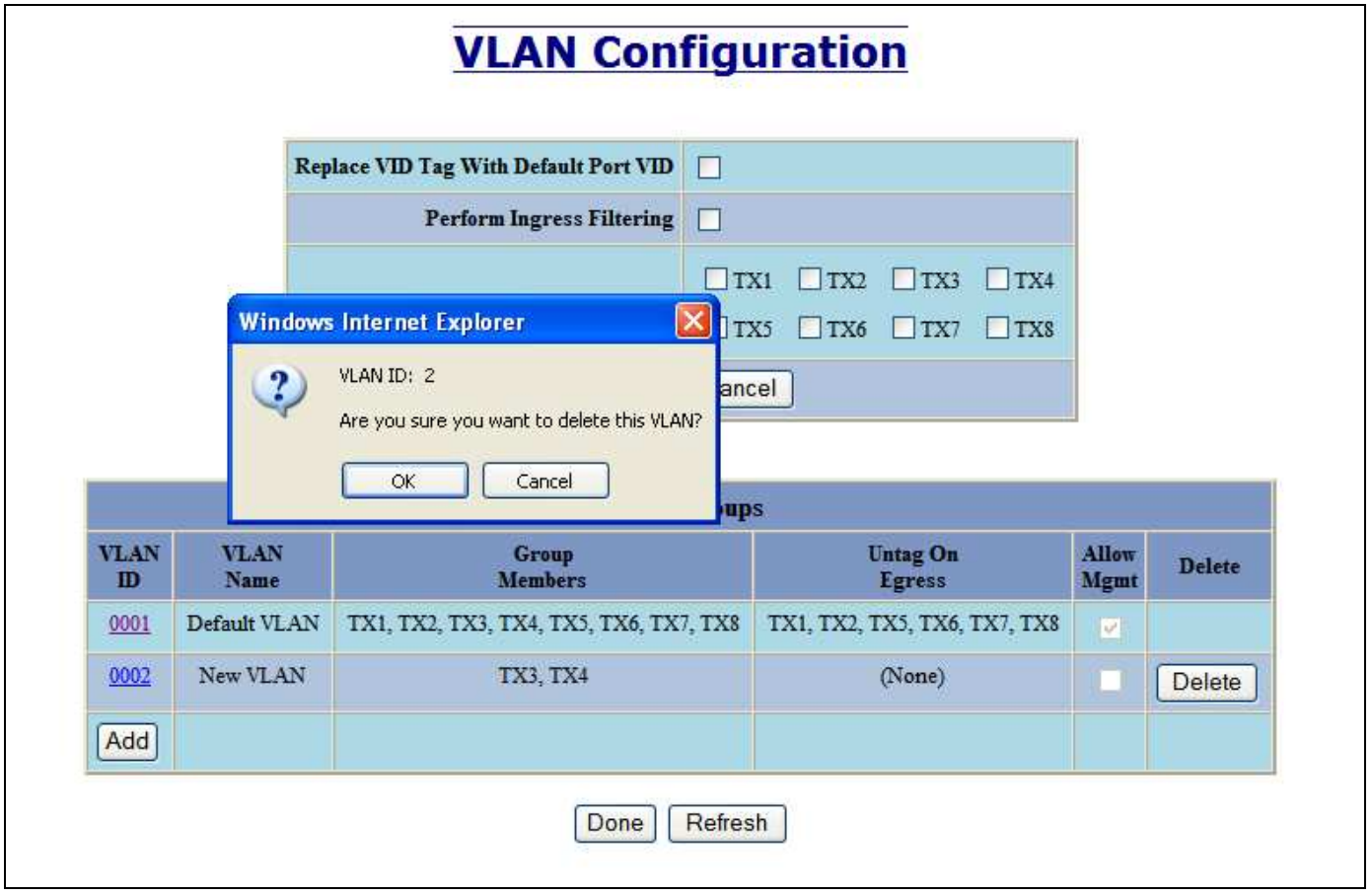
VLAN Configuration

Replace VID Tag With Default Port VID	☐
Perform Ingress Filtering	☐
Discard Non-Tagged For Ports	☐ TX1 ☐ TX2 ☐ TX3 ☐ TX4 ☐ TX5 ☐ TX6 ☐ TX7 ☐ TX8
Update Cancel	

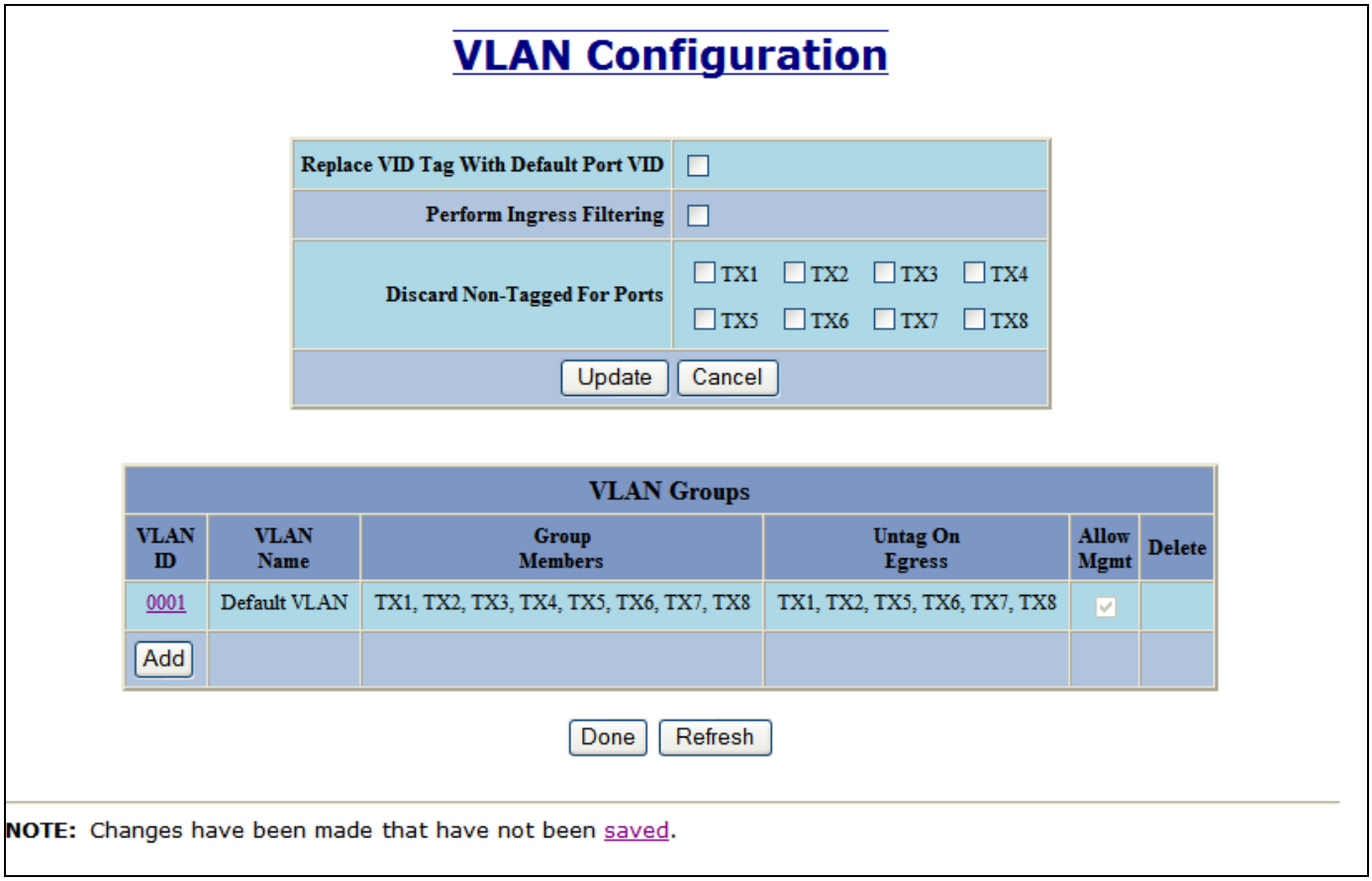
VLAN Groups

VLAN ID	VLAN Name	Group Members	Untag On Egress	Allow Mgmt	Delete
0001	Default VLAN	TX1, TX2, TX3, TX4, TX5, TX6, TX7, TX8	TX1, TX2, TX5, TX6, TX7, TX8	☑	
0002	New VLAN	TX3, TX4	(None)	☐	Delete
Add					

Done Refresh



And the “New VLAN” is removed. Note that the new configuration of the switch must be saved if the configuration must survive a power cycle.



VLAN Configuration Examples

A VLAN is an administratively configured LAN segment that limits the traffic in multiple broadcast domains. Instead of physically reconnecting a device to a different LAN, network administrators can accomplish this task by configuring a VLAN compliant switch to create logical network segments.

Tagged VLAN allows switch segmentation to span across multiple managed switches. This type of VLAN is ideal for LANs that consist of various types of communication groups such as Office LANs, Controls Systems, and IP Cameras. When used properly, it will effectively isolate two or more groups from each other in a logical manner. This means that Broadcast, Multicast, and Unicast frames in one VLAN will not interfere with another isolated VLAN group.

Example 1 – Basic understanding of port-based VLANs

VLAN Configuration View

Replace VID With Default Port VID	☐
Perform Ingress Filtering	☐
Discard Non-Tagged For Ports	(None)

VLAN ID	VLAN Name	Group Members	Untag On Egress	Allow Mgmt
0001	Default VLAN	TX3, TX4, TX5, TX6, TX7, TX8	TX3, TX4, TX5, TX6, TX7, TX8	☑
0002	VLAN-2	TX1, TX2	TX1, TX2	☐

Port Configuration View

Port No	Port Name	PVID
01	TX1	2
02	TX2	2
03	TX3	1
04	TX4	1
05	TX5	1
06	TX6	1
07	TX7	1
08	TX8	1

Receiving Port #	Tagged VID in packet	Destination Address	Transmitting Port #s	Notes
TX1	Untagged	MAC on port TX2	TX2	Unicast Traffic
TX1	Untagged	Unknown MAC	TX2	Floods VLAN 2
TX1	VID 4	MAC on port TX2	--	Packet Discarded
TX3	Untagged	MAC on port TX5	TX5	Unicast Traffic
TX3	Untagged	Unknown MAC	TX4-TX8	Floods VLAN 1
TX3	VID 4	MAC on port TX6	--	Packet Discarded

Example 2 – Basic understanding of tagged VLANs (Admit – Tagged Only)

VLAN Configuration View

Replace VID With Default Port VID	☐
Perform Ingress Filtering	☐
Discard Non-Tagged For Ports	TX1, TX2, TX3, TX5, TX6, TX7, TX8

VLAN ID	VLAN Name	Group Members	Untag On Egress	Allow Mgmt
0001	Default VLAN	TX3, TX5, TX6, TX7, TX8	(None)	☐
0002	VLAN-2	TX1, TX2	(None)	☐
0003	VLAN-3	TX4	(None)	☑

Port Configuration View

Port No	Port Name	PVID
01	TX1	1
02	TX2	1
03	TX3	1
04	TX4	3
05	TX5	1
06	TX6	1
07	TX7	1
08	TX8	1

Receiving Port #	Tagged VID in packet	Destination Address	Transmitting Port #s	Notes
TX1	Untagged	MAC on port TX2	--	Packet Discarded
TX1	VID 2	MAC on port TX2	TX2	Unicast Traffic
TX1	VID 4	MAC on port TX2	--	Packet Discarded
TX1	VID 2	MAC on port TX5	TX2	Floods VLAN 2
TX3	Untagged	MAC on port TX1	--	Packet Discarded
TX3	VID 1	MAC on port TX6	TX6	Unicast Traffic
TX3	VID 1	Unknown MAC	TX5-TX8	Floods VLAN 1
TX3	VID 4	MAC on port TX8	--	Packet Discarded

Example 3 – Basic understanding of tagged VLANs (Admit – All)

VLAN Configuration View

Replace VID With Default Port VID	☐
Perform Ingress Filtering	☐
Discard Non-Tagged For Ports	(None)

VLAN ID	VLAN Name	Group Members	Untag On Egress	Allow Mgmt
0001	Default VLAN	TX3, TX4, TX5, TX6, TX7, TX8	(None)	☑
0002	VLAN-2	TX1, TX2	(None)	☐

Port Configuration View

Port No	Port Name	PVID
01	TX1	2
02	TX2	2
03	TX3	1
04	TX4	1
05	TX5	1
06	TX6	1
07	TX7	1
08	TX8	1

Receiving Port #	Tagged VID in packet	Destination Address	Transmitting Port #s	Notes
TX1	Untagged	MAC on port TX2	TX2	Adds VID 2 to packet
TX1	VID 2	MAC on port TX2	TX2	Unicast Traffic
TX1	VID 4	MAC on port TX2	--	Packet Discarded
TX1	VID 2	Unknown MAC	TX2	Floods VLAN 2
TX3	Untagged	Unknown MAC	TX4-TX8	Adds VID 1 to packet & Floods VLAN 1
TX3	VID 1	MAC on port TX6	TX6	Unicast Traffic
TX3	VID 1	Unknown MAC	TX4-TX8	Floods VLAN 1
TX3	VID 4	MAC on port TX7	--	Packet Discarded

Example 4 – Basic understanding of Hybrid VLANs

VLAN Configuration View **Port Configuration View**

Replace VID With Default Port VID	☐
Perform Ingress Filtering	☐
Discard Non-Tagged For Ports	(None)

VLAN ID	VLAN Name	Group Members	Untag On Egress	Allow Mgmt
0001	Default VLAN	TX3, TX4, TX5, TX6, TX7, TX8	TX3, TX4, TX5, TX6, TX7, TX8	☑
0002	VLAN-2	TX1, TX2, TX3, TX4	TX1, TX2	☐

Port No	Port Name	PVID
01	TX1	2
02	TX2	2
03	TX3	1
04	TX4	1
05	TX5	1
06	TX6	1
07	TX7	1
08	TX8	1

Receiving Port #	Tagged VID in packet	Destination Address	Transmitting Port #s	Notes
TX1	Untagged	MAC on port TX2	TX2	Unicast Traffic
TX1	Untagged	MAC on port TX3	TX3	Adds VID 2 in the packet
TX1	VID 4	MAC on port TX2	--	Packet Discarded
TX1	VID 4	MAC on port TX3	--	Packet Discarded
TX1	VID 2	MAC on port TX2	TX2	Strips VID off packet
TX3	Untagged	MAC on port TX6	TX6	Unicast Traffic
TX3	Untagged	Unknown MAC	TX4-TX8	Floods VLAN 1
TX3	VID 4	MAC on port TX5	--	Packet Discarded
TX3	VID 4	MAC on port TX4	--	Packet Discarded
TX3	VID 2	MAC on port TX4	TX4	Does not strip VID off packet
TX3	VID 2	MAC on port TX1	TX1	Strips VID off packet

Example 5 – Basic understanding of Overlapping VLANs

VLAN Configuration View

Replace VID With Default Port VID	☐
Perform Ingress Filtering	☐
Discard Non-Tagged For Ports	(None)

VLAN ID	VLAN Name	Group Members	Untag On Egress	Allow Mgmt
0001	Default VLAN	(None)	(None)	☐
0002	VLAN-2	TX1, TX2, TX3, TX4, TX5, TX6, TX7, TX8	TX1, TX2, TX3, TX4, TX5, TX6, TX7, TX8	☐
0003	VLAN-3	TX2, TX3, TX4, TX5, TX6, TX7, TX8	TX2, TX3, TX4, TX5, TX6, TX7, TX8	☑
0004	VLAN-4	TX1, TX2	TX1, TX2	☐

Port Configuration View

Port No	Port Name	PVID
01	TX1	4
02	TX2	2
03	TX3	3
04	TX4	3
05	TX5	3
06	TX6	3
07	TX7	3
08	TX8	3

Receiving Port #	Tagged VID in packet	Destination Address	Transmitting Port #s	Notes
TX1	Untagged	MAC on port TX2, VID=4	TX2	Unicast Traffic
TX1	Untagged	MAC on port TX3	TX2	Floods VLAN 4
TX1	VID 4	MAC on port TX2, VID=4	TX2	Strips VID off packet
TX1	VID 4	Unknown MAC	TX2	Strips VID off packet & Floods VLAN 4
TX2	Untagged	MAC on port TX1, VID=2	TX1	Unicast Traffic
TX2	Untagged	MAC on port TX5, VID=2	TX5	Unicast Traffic
TX2	VID 2 or 3	MAC on port TX5, VID=2 and 3	TX5	Strips VID off packet (or floods if MAC is unknown for VID)
TX2	Untagged	Unknown MAC	TX1, TX3-TX8	Floods VLAN 2
TX3	Untagged	MAC on port TX1, VID=3	TX2, TX4-TX8	Floods VLAN 3
TX3	Untagged	MAC on port TX2, VID=3	TX2	Unicast Traffic
TX3	Untagged	MAC on port TX5, VID=3	TX5	Unicast Traffic
TX3	VID 2 or 3	MAC on port TX2, VID=2 and 3	TX2	Strips VID off packet (or floods if MAC is unknown for VID)

Example 6 – Basic understanding of VLANs with Multicast Filtering

VLAN Configuration View **Port Configuration View**

Replace VID With Default Port VID	☐
Perform Ingress Filtering	☐
Discard Non-Tagged For Ports	(None)

VLAN ID	VLAN Name	Group Members	Untag On Egress	Allow Mgmt
0001	Default VLAN	(None)	(None)	☐
0002	VLAN-2	TX1, TX2, TX3, TX4, TX5, TX6, TX7, TX8	TX1, TX2, TX3, TX4, TX5, TX6, TX7, TX8	☐
0003	VLAN-3	TX2, TX3, TX4, TX5, TX6, TX7, TX8	TX2, TX3, TX4, TX5, TX6, TX7, TX8	☑
0004	VLAN-4	TX1, TX2	TX1, TX2	☐

Port No	Port Name	PVID
01	TX1	4
02	TX2	2
03	TX3	3
04	TX4	3
05	TX5	3
06	TX6	3
07	TX7	3
08	TX8	3

Top of Form
Bottom of Form

Static Multicast Group Address Filters		
Multicast Address	**Port List**	**VLAN ID**
01:00:00:00:00:01	TX1, TX2, TX3, TX4, TX5, TX6, TX7, TX8	2
01:00:00:00:00:02	TX1, TX6, TX8	3

Receiving Port #	Tagged VID in packet	Destination Address	Transmitting Port #s	Notes
TX1	Untagged	01:00:00:00:00:01	TX2	Goes to ports TX1-TX8, but TX1 can only send to TX2 (VLAN 4)
TX3	Untagged	01:00:00:00:00:02	TX6, TX8	Goes to ports TX2, TX6-TX8 (VLAN 3) but filter keeps it on ports TX6 and TX8 only
TX2	Untagged	01:00:00:00:00:01	TX1,TX3-TX8	Goes to ports TX1-TX8, but won't go back out the port it came in on
TX2	Untagged	01:00:00:00:00:02	TX1,TX3-TX8	Goes to ports TX1,TX3-TX8
TX3	Untagged	01:00:00:00:00:01	TX2, TX4-TX8	Goes to ports TX2, TX4-TX8
TX6	Untagged	01:00:00:00:00:02	TX8	Goes to port TX8
TX3	Untagged	01:00:00:00:00:02	TX6, TX8	Goes to ports TX6 and TX8

Note: If there are multiple ports on different VLANs, the 708 will apply the static multicast address to the lowest VLAN-ID that is associated with one of the ports assigned to the static multicast address. If the lowest VLAN-ID contains all the ports assigned to the static multicast address (an umbrella VLAN), it will function for all those ports with no problems. This can be achieved with overlapping VLANs.

For further information and examples on overlapping vlans, see:
http://www.n-tron.com/pdf/OverlappingPortVLAN.pdf

KEY SPECIFICATION

Switch Properties

Number of MAC Addresses:	8,000
Aging Time:	Programmable
Latency Type:	2.9 µs
Switching Method:	Store & Forward

Physical

Height:	6.62” (16.81 cm)
Width:	6.62” (16.81 cm)
Depth:	2.09” (5.31 cm)
Weight:	3.25 lbs. (1.48 kg)
DIN Rail	35 mm (Optional)

Electrical

Redundant Input Voltage:	10-49VDC (Regulated)
708M12 Input Current (max):	250mA max. @ 24VDC
Inrush @ 24VDC:	15.0A/1.0ms @ 24VDC
Input Ripple:	Less than 100 mV
N-TRON Power Supply:	NTPS-24-1.3 (1.3 Amp@24VDC*)*

Environmental

Operating Temperature: -40°C to 80°C
Storage Temperature: -40°C to 85°C

Operating Humidity: 5% to 100%
(Non Condensing)

Operating Altitude 0 to 10,000 ft.

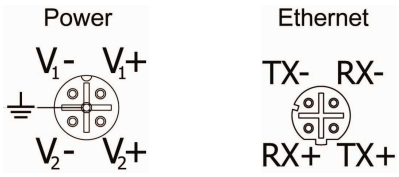
Shock and Vibration (bulkhead mounting)

Shock: 200g @ 10ms
Vibration/Seismic: 50g, 5-200Hz,Triaxial

Reliability

MTBF: >2 Million Hours

Pin Assignments



Connectors

10/100BaseTX: (8) M12 D Coded Female Copper Ports
POWER: (1) M12 A Coded Male Port
COM: (1) M12 A Coded Female CLI Port
NTCD-M12: (1) M12 A Coded Female Configuration Dongle Port

Recommended Wiring Clearance:

Front: 4" (10.16 cm)

Network Media

10BaseT: >Cat3 Cable
100BaseTX: >Cat5 Cable
minimum length : 1 meter
maximum length : 100 meters

Warranty: 3 years from the date of purchase.

Regulatory Approvals:

EMI: EN61000-6-4, EN55011 – Class A
CFR Title 47, Part 15, Subpart B - Class A
ICES-003 – Class A

EMS: EN61000-6-2
EN61000-4-2 (ESD)
EN61000-4-3 (RS)
EN61000-4-4 (EFT)
EN61000-4-5 (Surge)
EN61000-4-6 (Conducted Disturbances)
IEC 61000-4-8 (Power-frequency Magnetic Field)
IEC 61000-4-11 (Voltage Dips and Interruptions)

N-TRON Limited Warranty

N-TRON, Corp. warrants to the end user that this hardware product will be free from defects in workmanship and materials, under normal use and service, for the applicable warranty period from the date of purchase from N-TRON or its authorized reseller. If a product does not operate as warranted during the applicable warranty period, N-TRON shall, at its option and expense, repair the defective product or part, deliver to customer an equivalent product or part to replace the defective item, or refund to customer the purchase price paid for the defective product. All products that are replaced will become the property of N-TRON. Replacement products may be new or reconditioned. Any replaced or repaired product or part has a ninety (90) day warranty or the remainder of the initial warranty period, whichever is longer. N-TRON shall not be responsible for any custom software or firmware, configuration information, or memory data of customer contained in, stored on, or integrated with any products returned to N-TRON pursuant to any warranty.

OBTAINING WARRANTY SERVICE: Customer must contact N-TRON within the applicable warranty period to obtain warranty service authorization. Dated proof of purchase from N-TRON or its authorized reseller may be required. Products returned to N-TRON must be pre-authorized by N-TRON with a Return Material Authorization (RMA) number marked on the outside of the package, and sent prepaid and packaged appropriately for safe shipment. Responsibility for loss or damage does not transfer to N-TRON until the returned item is received by N-TRON. The repaired or replaced item will be shipped to the customer, at N-TRON's expense, not later than thirty (30) days after N-TRON receives the product. N-TRON shall not be responsible for any software, firmware, information, or memory data of customer contained in, stored on, or integrated with any products returned to N-TRON for repair, whether under warranty or not.

ADVANCE REPLACEMENT OPTION: Upon registration, this product qualifies for advance replacement. A replacement product will be shipped within three (3) days after verification by N-TRON that the product is considered defective. The shipment of advance replacement products is subject to local legal requirements and may not be available in all locations. When an advance replacement is provided and customer fails to return the original product to N-TRON within fifteen (15) days after shipment of the replacement, N-TRON will charge customer for the replacement product, at list price.

WARRANTIES EXCLUSIVE: IF AN N-TRON PRODUCT DOES NOT OPERATE AS WARRANTED ABOVE, CUSTOMER'S SOLE REMEDY FOR BREACH OF THAT WARRANTY SHALL BE REPAIR, REPLACEMENT, OR REFUND OF THE PURCHASE PRICE PAID, AT N-TRON'S OPTION. TO THE FULL EXTENT ALLOWED BY LAW, THE FOREGOING WARRANTIES AND REMEDIES ARE EXCLUSIVE AND ARE IN LIEU OF ALL OTHER WARRANTIES, TERMS, OR CONDITIONS, EXPRESS OR IMPLIED, EITHER IN FACT OR BY OPERATION OF LAW, STATUTORY OR OTHERWISE, INCLUDING WARRANTIES, TERMS, OR CONDITIONS OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, SATISFACTORY QUALITY, CORRESPONDENCE WITH DESCRIPTION, AND NON-INFRINGEMENT, ALL OF WHICH ARE EXPRESSLY DISCLAIMED. N-TRON NEITHER ASSUMES NOR AUTHORIZES ANY OTHER PERSON TO ASSUME FOR IT ANY OTHER LIABILITY IN CONNECTION WITH THE SALE, INSTALLATION, MAINTENANCE OR USE OF ITS PRODUCTS. N-TRON SHALL NOT BE LIABLE UNDER THIS WARRANTY IF ITS TESTING AND EXAMINATION DISCLOSE THAT THE ALLEGED DEFECT OR MALFUNCTION IN THE PRODUCT DOES NOT EXIST OR WAS CAUSED BY CUSTOMER'S OR ANY THIRD PERSON'S MISUSE, NEGLECT, IMPROPER INSTALLATION OR TESTING, UNAUTHORIZED ATTEMPTS TO OPEN, REPAIR OR MODIFY THE PRODUCT, OR ANY OTHER CAUSE BEYOND THE RANGE OF THE INTENDED USE, OR BY ACCIDENT, FIRE, LIGHTNING, POWER CUTS OR OUTAGES, OTHER HAZARDS, OR ACTS OF GOD.

LIMITATION OF LIABILITY: TO THE FULL EXTENT ALLOWED BY LAW, N-TRON ALSO EXCLUDES FOR ITSELF AND ITS SUPPLIERS ANY LIABILITY, WHETHER BASED IN CONTRACT OR TORT (INCLUDING NEGLIGENCE), FOR INCIDENTAL, CONSEQUENTIAL, INDIRECT, SPECIAL, OR PUNITIVE DAMAGES OF ANY KIND, OR FOR LOSS OF REVENUE OR PROFITS, LOSS OF BUSINESS, LOSS OF INFORMATION OR DATA, OR OTHER FINANCIAL LOSS ARISING OUT OF OR IN CONNECTION WITH THE SALE, INSTALLATION, MAINTENANCE, USE, PERFORMANCE, FAILURE, OR INTERRUPTION OF ITS PRODUCTS, EVEN IF N-TRON OR ITS AUTHORIZED RESELLER HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES, AND LIMITS ITS LIABILITY TO REPAIR, REPLACEMENT, OR REFUND OF THE PURCHASE PRICE PAID, AT N-TRON'S OPTION. THIS DISCLAIMER OF LIABILITY FOR DAMAGES WILL NOT BE AFFECTED IF ANY REMEDY PROVIDED HEREIN SHALL FAIL OF ITS ESSENTIAL PURPOSE.

DISCLAIMER: Some countries, states, or provinces do not allow the exclusion or limitation of implied warranties or the limitation of incidental or consequential damages for certain products supplied to consumers, or the limitation of liability for personal injury, so the above limitations and exclusions may be limited in their application to you. When the implied warranties are not allowed to be excluded in their entirety, they will be limited to the duration of the applicable written warranty. This warranty gives you specific legal rights which may vary depending on local law.

GOVERNING LAW: This Limited Warranty shall be governed by the laws of the State of Alabama, U.S.A